

Indiana Tech Flash

Indiana's Most Comprehensive Electronic Resource For
Engineering & Technology Education.



Special points of interest:

- The I-STEM Resource Network
- 50 Pages of Resources!
- The New IDOE Vision & Plan



Features inside this issue include:

Construction &
Architecture
Resources

Engineering,
Design, &
Communication
Technology
Resources

Energy, Power &
Transportation
Resources

Manufacturing &
Production
Resources

STEM Resources

Professional
Resources

AND MORE!

Summer 2009

I-STEM Advances "Technology & Engineering" of STEM.



The I-STEM Resource Network supports the teachers and leaders working to implement high academic standards towards STEM literacy for all students. The network also provides Indiana leaders with new knowledge about teaching and learning.

The I-STEM vision is for Indiana to be a national leader in student achievement in STEM disciplines and improve the quality of the workforce. In the fall of 2008, the network

started an unprecedented partnership to begin to advance engineering & technology as a part of STEM.

Collaboration with highly committed leaders representing higher education, K-12 schools, business, industry and government have recently led to the development of the newest I-STEM committee whose goal is to help advance engineering & technology education. On

July 10, 2009 the committee met and have started to develop a mission and a vision for the future of engineering and technology education in Indiana.

In the coming months, the work group will be conducting research, determining the current status of the content and preparing a report based on the need to advance engineering & technology education in Indiana. The report is anticipated to be completed in the spring of this coming school year.

To learn more about the I-STEM Resource Network, please visit:

www.istemnetwork.org

Upcoming To Be Announced Dates for 2009 - 2010!

E/TEI Fall Conference (Indianapolis) — TBA, Fall 2009
Engineering & Technology Rotunda Day (State House) — TBA, Winter 2010
FIRST Boilermaker Educator Program — TBA, Spring 2010
FIRST Boilermaker Educator Program — TBA, Spring 2010
FIRST Boilermaker Robotics (Lafayette) - TBA Spring, 2010
FIRST Boilermaker Robotics (Lafayette) - TBA Spring, 2010
FIRST Robotics Cage Match (Southport High School) - TBA, Fall 2009
I-ACTE Conference (Indianapolis) — TBA, Fall 2009
IMSTEASuper Mileage Challenge (O'Reilly Raceway Park) - TBA, Spring 2010
ISU Tech T.R.E.K (Terre Haute) TBA, Fall 2009
ITEA Conference (Charlotte, NC) — March 18-20, 2010
IUPUI Bridge Contest (Indianapolis) - TBA, Winter 2010
IUPUI Motorsports Day (Indianapolis) - TBA, Fall 2009
PLTW IED Contests 2009 - TBA Winter 2010
PLTW Student Conference (IUPUI) - TBA, Winter 2010

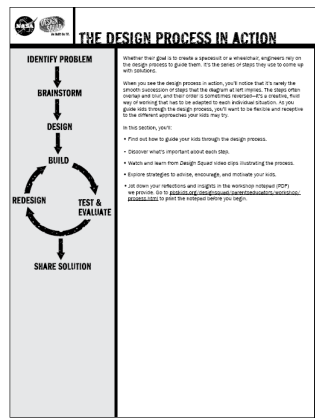
The Design Process in Action!



When you see the design process in action, you'll notice that it's rarely the smooth succession of steps that the diagram at left implies. The steps often overlap and blur, and their order is

sometimes reversed—it's a creative, fluid way of working that has to be

situation. As you guide kids through the design process, you'll want to be flexible and receptive to the different approaches your kids may try.



http://www-tc.pbskids.org/designsquad/parentseducators/workshop/pdf/designprocess_in_action.pdf

adapted to each individual

CIESE sponsors and designs interdisciplinary projects that teachers throughout the world can use to enhance their curriculum through compelling use of the Internet.

We focus on projects that utilize real time data available from the Internet, and collaborative projects that utilize the Internet's potential to reach peers and experts around the world.



Frank Lloyd Wright Preservation Trust Architect 3D Studio

On this Web site, you can design a house, walk through it in 3D, and then share it with the world. You can also learn more about architecture, past and present, and explore Frank Lloyd Wright's life and work OR Try the **Design Studio Lite**, where you can design your floor plan, but you can't see your house in 3D.



<http://architectstudio3d.org/AS3d/index.html>

<http://www.ciese.org/currichome.html>

Autodesk Project Dragonfly

allows you to streamline your next home improvement project by using Dragonfly's intuitive design tools to rapidly create and furnish your floor plan, experimenting in real time with your ideas in 2D and 3D before making it real

<http://dragonfly.autodesk.com>





West Point Bridge Design Contest

Introduce your students to engineering through an authentic, hands-on design experience. This **FREE** software provides you with the tools to model, test, and optimize a steel highway bridge, based on realistic specifications, constraints, and performance criteria.



<http://bridgecontest.usma.edu/download.htm>

The **Construct My Future** web site presents a comprehensive link to information and materials for teachers, students, and parents about the construction industry. With resources for Parents, Students and Teachers as well as grants, publications and scholarships, this resource is well worth looking into!

[http://](http://www.constructmyfuture.com/)

www.constructmyfuture.com/



Indiana Create a Landmark Contest for Students

Cardboard and glue become building materials during our model-building contest for students

[Read More](#)

<http://www.historiclandmarks.org/Resources/Classroom/CreateLandmark/Pages/default.aspx>



City of Materials is an interactive online environment where you

can explore the materials that are part of our everyday lives! City of

Materials is a technology rich, web-based, visual, and interactive. The goal is for students to connect with Materials Science and Engineering both as a real-world engineering discipline and as a possible career.

<http://www.cityofmaterials.com/portal/site/cityofmaterials/>



Bridges, domes, skyscrapers, dams, and tunnels take center stage. BUILDING BIG explores the history behind some of the world's greatest feats of engineering and the ingenuity of the engineers, architects, and builders who designed and built them.

<http://www.pbs.org/wgbh/buildingbig/>



Geodesic Domes Teaching Guide

Unlike traditional domes, these structures did not have a surface formed from solid building materials. Instead, there were assembled from a geometric framework of connecting rods. These open

frame structures are called geodesic domes. They were invented by Buckminster Fuller over fifty years ago. If you examine the dome, you'd find that the basic unit of the frame is a triangle. As triangles are joined together, they form a pattern of increasing geometric complexity. The final result is a curved and sturdy surface that approaches spherical geometry.

<http://www.pbs.org/saf/1304/teaching/teaching2.htm>



Google SketchUP

is a free easy-to-learn 3D modeling program that enables you to explore the world in 3D. With just a few simple tools, you can create 3D models of houses, sheds, decks, home additions, woodworking projects - even space ships. Once you've built your models, you can post them to the **3D Warehouse**, or print hard copies.

<http://sketchup.google.com/>

Google SketchUp

Home
Products
Downloads
Buy
Community
Industries
Training
Help

Welcome to Google SketchUp

You can use Google SketchUp to create, modify and share 3D models. [Learn more about Google SketchUp.](#)
Now! Build models and add them to Google Earth.



Free Versions of ProgeCAD Software!



ProgeCAD supplies classrooms and students with a solution to train for the future!

Use Full Professional 2D/3D software in your curriculum, the same AutoCAD compatible software process used by the majority of businesses in the world.

Only Qualifying North American Educational Institutions may qualify for free copies of ProgeSOFT IntelliCAD products for use by your students in the classroom!

Features include:

- included library of Blocks and Symbols for
- Electrical
- Mechanical
- Architectural
- Civil/Survey
- applications for Mechanical and Architectural available.

<http://www.progesoft.us/index.pl>

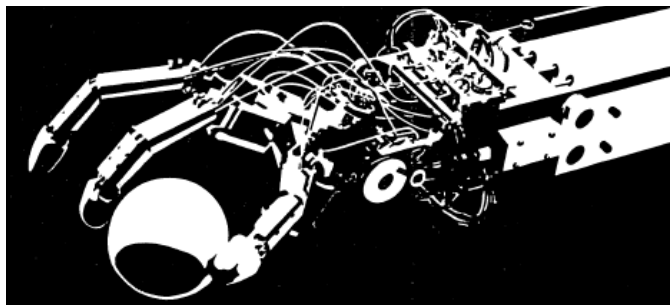
Technology Education Publications are Now Available Online as Downloadable PDF's

Several NYSED technology education publications are now available on line as downloadable pdf files.

Included in these publications is the middle level curricular support document titled, Introduction To Technology Grades 7 & 8, commonly referred to as the "Blue Book". Although

technology related publications become outdated rather quickly, these documents can still be of value as reference materials to be used at the local discretion of a school district.

<http://www.emsc.nysed.gov/cte/technology/pub/>



U.S. Department of Energy Energy Efficiency and Renewable Energy

Get Smart About Energy!

The Department of Energy's new Get Smart About Energy! Web site includes hands-on activities that address energy fundamentals, energy efficiency, sources of energy, and the environmental impacts of energy use. All the activities and lesson plans



are aligned with the National Science Education Standards. Teacher guides are

included with many of the lessons and all the materials are free and reproducible. The Web site will help to equip today's students with the knowledge and resources to develop cutting-edge energy technologies in the future.

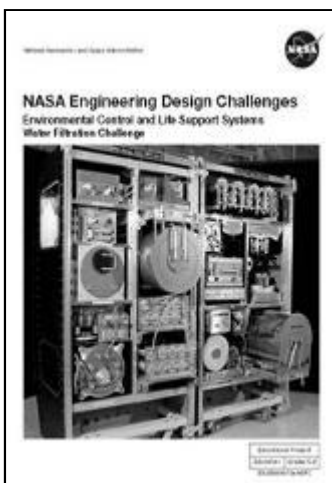
<http://www.eere.energy.gov/education/lessonplans/>



Simulation program trains educators in classroom management

A computer program could help combat the high attrition rate among first-year teachers by giving them an idea of what to expect in the classroom. The simSchool program allows educators to put together lessons and see how students with varied academic ability, willingness to learn and behavioral attributes respond.

<http://www.simschool.org/>



Grades 5-8 Earth provides the air we breathe, the water we drink, and other conditions that support life. Earth is a natural life support system. The activities in this guide focus on water recovery and management. The challenge is to design and build a water filtration device using commonly available materials. To meet this challenge, students build, test and measure the performance

of the filtration device, analyze the data collected, and use this information to work towards an improved filtration design.

http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Water_Filtration_Challenge.html



The National Center for Technological Literacy Supports the integration of engineering as a new discipline in schools nationwide and to inspire the next generation of engineers and innovators. NCTL fosters learning about how technologies are created and used. It offers educational products and programs for pre-K-12 students and teachers, creates curricula, supports an online resource center, and engages in partnership and outreach with other institutions. NCTL works with state departments of education and teacher organizations to facilitate the re-engineering of curricula and learning standards.

<http://www.mos.org/nctl/>

Autodesk® Student Engineering & Design Community



Free Autodesk software for students!

<http://students4.autodesk.com/>



The Infinity Project is a national award winning K12 and early college math, science, technology and engineering technology initiative that helps educators deliver a maximum of engineering exposure with a minimum of training, expense and time.

Created to help students see the real value of math and science and its varied applications to high tech engineering The Infinity

Project is working with schools all across the country to bring the best of engineering to their students. Learn about Infinity and how it works and find out how The Infinity Project is making an impact in states all across the country.

You'll definitely want to learn about the world class program elements that enhance the Infinity classroom experience: the innovative Engineering Our Digital Future textbook, the state of the art Infinity

Technology Kit and comprehensive professional development courses for teachers.

If you are an educator take the next step and check out all of our available free materials. If you are ready to be part of The Infinity Project right now, you can access applications for the program and grants at:

<http://www.infinity-project.org/>



**FORD PARTNERSHIP
FOR ADVANCED STUDIES**
Next Generation Learning 

NATIONAL FORD PAS RESOURCE HUB ANNOUNCED

Ford PAS is an academically-rigorous curriculum taught through the lens of a career.

It prepares students for college and high-wage, high-skill fields including business, engineering, technology, design, alternative energy, and global economics.

The curriculum, which is enhanced through professional development

for teachers, brings together all parts of the community -- business partners, higher education, high schools, teachers, community organizations, and students -- to provide career-relevant learning opportunities for students.

<http://www.fordpas.org/>

Earthquake Resistant Structures!

What Can I Build On?

The ability of buildings to withstand earthquakes is dependent on maintaining structural integrity on the substrate in which the building is constructed.

This lesson will challenge students to design and test building design modifications capable of withstanding liquefaction.



Enrichment Lesson 4: Engineering Application: What Can I Build On?

Overview
The ability of buildings to withstand earthquakes is dependent on structural integrity and the substrate on which the building is constructed. During an earthquake, the underlying substrate tends to compact, a process termed liquefaction. This lesson will challenge students to develop design strategies capable of withstanding liquefaction.

Objectives

- Explore how earthquakes cause structures to move
- Understand how the substrate cause buildings to fail
- Discover what variables affect building stability
- Engineer a model building to withstand earthquakes better

<http://www.ciese.org/curriculum/musicalplates3/en/teacherenrichment4.shtml>



Go Engineering! - is a resource to promote the importance of engineering and technology education and explore the many ways that engineering & technology can help teachers meet the challenge of making STEM come alive for students.

<http://www.engineeringk12.org/educators/>



Teach Engineering - Teach Engineering helps teachers enhance learning, excite students and stimulate interest in STEM through the use of hands-on engineering.

<http://www.teachengineering.com/index.php>



Physics Education Technology - offers fun, interactive simulations of including velocity, projectile motion, electricity and electronic circuits, acceleration, sound waves, the Doppler effect and much more!

<http://www.colorado.edu/physics/phet/web-pages/index.html>



I-Design - Design thinking is what people do when they pursue their goals. Everyone focuses their thinking in order to satisfy wants and needs regarding a particular situation.

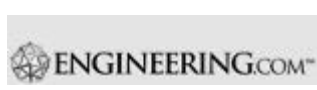
Designers recognize and define information relevant to their purpose, consider alternatives, decide what to do, do it, determine if they are satisfied with the results, and if not, revise their approach until they are successful, all while learning through the experience.

<http://www.idesignthinking.com/main.html>



Open Office is both a multi-platform and multi-lingual office suite and an open-source project. Compatible with all other major office suites, the product is FREE to download, use, and distribute. To help build the community, join us.

<http://www.openoffice.org/>



Engineering.com is an engineer's ultimate resource tool. Features of the web page include a variety of calculators, newsletters, tables, textbooks, and free software applications.

<http://www.engineering.com>



The Science of Speed
This site is dedicated to the pursuit of designing and building CO₂-powered racecars and making them go fast. This is done by employing an understanding of physical forces at work. CO₂ racing is enormously fun and motivates students to learn.

<http://www.science-of-speed.com/default.asp>



Inside TIDE - ITEA's cutting-edge electronic newsletter delivers the latest trends and "inside" information to its subscribers.

[https://
www.iteaconnect.org/
Forms/
insideTIDEform.htm](https://www.iteaconnect.org/Forms/insideTIDEform.htm)

Adobe Digital Kids

In the story behind storyboards, the Adobe Digital Kids club shares resources about how feature films, animated movies, and commercials have one thing in common. They each begin as storyboards!

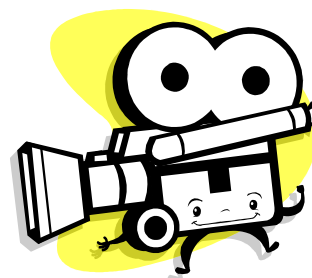
Before a camera is picked up or a tape is taken out of shrink-wrap, the blueprint for the project has already been designed. That blueprint

is the storyboard which is a visual outline for the video. Storyboards are not usually fancy — stick-figure drawings will do.

But they save time.

For professional producers, time is money. School time is no less valuable and storyboarding is an important skill to learn.

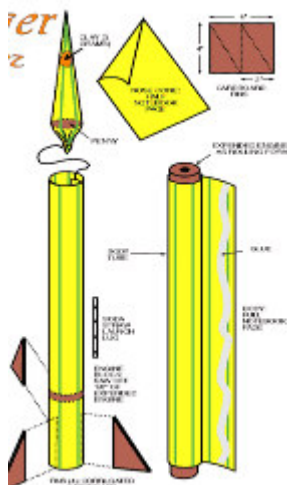
[http://www.adobe.com/
education/digkids/
lessons/
storyboards.html](http://www.adobe.com/education/digkids/lessons/storyboards.html)



Paper Tiger Rocket Plans

Need a low cost rocket your students can build? Try our a proven design originated by a middle school teacher. (GIF)

[http://www.nar.org/images/
papertig.gif](http://www.nar.org/images/papertig.gif)



Ultra Low Cost Launch System

Got rockets but need a low cost launch system? Ted Mahler's set of plans and instructions can put a fully functional launcher in each student's hands for about \$5. (HTML)

[http://www.nar.org/NARTS/
mahler/ultra.html](http://www.nar.org/NARTS/mahler/ultra.html)



Junk Box Wars – "To invent, you need a good imagination and a pile of junk." Did you like the TV show Junk Yard Wars? Junk Box Wars might be the inspiration you need!

[http://sciencespot.net/
Pages/junkbox.html](http://sciencespot.net/Pages/junkbox.html)



Discover Hover — Learn by building and racing hovercraft! **Discover Hover** provides hovercraft plans at no charge to schools.

[http://
www.discoverhover.org/](http://www.discoverhover.org/)



Sightseer's Guide to Engineering is an archive of local and state resources to help you share the excitement of engineering and technology through being their experiences!

[http://
www.engineeringsights.org/](http://www.engineeringsights.org/)



FREE Water Rocket Software

This program can help students understand the physics of water rockets and how to optimize their water rocket to obtain the highest apogee.

The interface is designed to be easy to use and

understand. Don't be fooled by the program's simple layout, few simulators are as accurate. Under the hood, this program is pretty sophisticated.

The methodology includes both incompressible and compressible fluid mechanics along with a

fair amount of thermodynamics and numerical methods to provide accurate water rocket apogee predictions.

Free download at:

<http://www.seeds2learn.com/rocketSoftware.html>

Space Foundation Educator Resources



Attention all K-12 educators! FREE educational guides, software, & posters for your classroom. Visit the Space Foundation's Educator Resource Center

<http://www.spacefoundation.org/education/>

NASA Education Resources



NASA recognizes the importance of educators. NASA is dedicated to supporting them in the disciplines of STEM. NASA provides educators with unique resources and development opportunities to strengthen teaching.

<http://education.nasa.gov/home/index.html>

American Institute of



Aeronautics and Astronautics FREE

membership for Educators in grades K through 12 interested in the development or application of science, engineering mathematics, and technology for their curriculum.

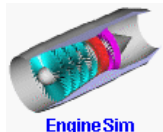
<http://www.aiaa.org/>



FoilSim II

FoilSim is a wind tunnel simulator that includes a stall model for the airfoil. Interactive lessons that accompany the package prompt students to engage in problem solving and discovery. They include:

- Factors That Affect Lift
- How Lift Changes
- Flow Field Details
- The Lift Coefficient



EngineSim is a simulator that models the design and testing of jet

engines and the effects of engine type on aircraft speed and range. The program works in two modes: Design Mode or Tunnel Test Mode.

When you have a design that you like, you can switch to the Tunnel Test Mode, where you can vary only the flight conditions (airspeed, altitude, and throttle setting)

<http://www.grc.nasa.gov/WWW/K-12/aerosim/>



Free Lab Safety Support Materials! The TEEA

Technology Education Association of Tennessee has many great support materials for you to use such as safety rules, guides, and tests. In addition, various safety posters are also available.

<http://www.tennessee-teea.org/>



Engineering byDesign™

Center to Advance Teaching Science and Technology (CATTS)
Human Exploration Project
Invention, Innovation, Inquiry (I3)
Technological Literacy Standards

To learn more about Engineering by Design please visit:

<http://www.iteaconnect.org/>



This book of **Problem Solving Activities** has been compiled by the Georgia Industrial Technology Education Association. Members of our professional

organization have contributed ideas and activities that work in their classrooms and laboratories.

We hope that these activities will be beneficial to you in your classroom or laboratory situation. Please feel free to reproduce any portions of this booklet or the entire book to use in your classes or to share with other teachers. GITEA is working to improve and enhance Technology Education in Georgia. We appreciate this opportunity to share our ideas with you.

For additional information or if you have ideas and activities that you would like to and are willing to share with us please send to:

GITEA
P. O. Box 347224, Atlanta,
Georgia 30334

<http://www.gitea.org/Teacher%20Resources.htm>



The Pringles Challenge

The Pringles Challenge is great! Your students will learn the most, and you will maintain your sanity for the longest time if you follow a few simple steps. There is no one best way to do this. I've been through the Challenge three times. I want to show you how I have done it. Feel free to modify this plan to suit your individual needs. I first used the with my Design students' after I was introduced to the "Georgia Cookbooks" several years ago. Well a teacher has now made it a **national contest!** The entry deadline for 2008 is closed, but you might want to keep this in mind for 2009.

<http://www.gatesscience.info/teamescience/project/pringle/2008/pring2008.htm>

D&T Online is a World Wide Web site offering free access to a wide range of design and technology (D&T) materials, resources and software for students to use as they engage in design and technology activities. The content of some sections will be relevant to science and mathematics as well as

design and technology. D&T Online is a safe site for children: all materials have been provided freely by teachers and there are no links to any other Internet sites. The service is under continuous development - comments and/or contributions from teachers are always welcome.

<http://www.dtonline.org>

Featured design & technology lesson resources include:

- Electronics
- Packaging
- Environments
- Food
- Pneumatics
- Mechanisms
- Manufacturing
- Structures



The MSTe Project: Integrating Mathematics, Science, and Technology in the Elementary Schools, is a five-year, \$7.4 M. collaborative effort from the State University of New York at Stony Brook, Hofstra University, and Brookhaven National Laboratory. The goal of this project is to develop models for the integration of mathematics, science, and technology into the elementary schools. To accomplish this goal, activities focused upon the

integration of experiences in technology with contemporary approaches in mathematics and science. Participants utilized exemplary curriculum materials and activities in technology education to enrich the elementary school experiences in mathematics and science.

http://www.hofstra.edu/Academics/SOEAHs/TEC/MSTe/index_MSTe.cfm

The NSF funded ATE project, "New York State



HOFSTRA UNIVERSITY

Curriculum for Advanced Technological Education," develops exemplary standards-based materials that are chosen on the basis of a proven track record and relevance to technology education.

In addition the pedagogical focus of informed design is used

which emphasizes science inquiry and mathematical analysis in the context of design. The project is devoted to widespread dissemination through technology education conferences and mini-conferences at colleges.

These activities are ultimately establishing ATE professional development centers at partnering colleges. By building the capacity of teacher/leaders to

conduct enhancement workshops, the project is creating a replicable and transportable model of professional development and imparting a mechanism through which ongoing staff development can be sustained.

http://www.hofstra.edu/Academics/SOEAH/TEC/TEC_nyspdc.cfm



Girls Go Tech emphasizes to girls that even if you don't realize it, math, science, and technology play an important part in your life. It is all around you! During your lifetime you will have to depend more and more on your understanding of these subjects, but you'll be surprised how much fun you can have, and are already having, with math, science, and technology.

Resources include:

- Games
- Career exploration
- Web resources
- And more!

<http://www.girlsgotech.org/>



KINEMATIC MODELS FOR DESIGN DIGITAL LIBRARY

an open access, multimedia resource for learning & teaching about kinematics and the history & theory of machines

Geometry of Pure Motion

Digital Kinematic Library of Printable 3D Machines

Is it possible to put actual objects from digital library collections into students' hands? The "Digital Library of Printable Machines (DLPM): Models for Collection Building and Educational Outreach" research

project funded by the Institute for Museum and Library Services (IMLS) in its Model Programs of Library-Museum Collaboration program believes that it is. The project is an activity of the Kinematic Models for Design Digital Library (KMODDL) funded by the NSF NSDL program.

DPLM is led by the Cornell University Library (CUL) in partnership with Cornell's College of Engineering, and the Museum of Science (MOS) in Boston.

<http://kmoddl.library.cornell.edu/>



Join the ITEA Robotics Technology Interest Group (TIG)

This forum is dedicated to those interested in the topics of automation and robotics education.

All individuals are invited to join ITEA's **T**echnology **I**nterest **G**roups (**TIG**). TIGs are designed to facilitate dialogue between professionals with an interest in specific technological issues or initiatives. These forums were created for the purpose of sharing information, advancing education, and creating progress in the study of technology, innovation, design, and engineering education.

Non ITEA members may join any one TIG at no cost. ITEA members may join as many TIGs as desired.

Moderators - Steve Florence, West Lafayette High School and Craig Harvey, Stonybrook Middle School.

<http://www.iteaconnect.org/Networking/technologyinterestgroups.htm>



Design and Discovery

Experiencing Engineering
Through Design

Enter Design and Discovery

Enter

Looking for a way to get students interested in engineering? *Design and Discovery* is a **free** program that includes a complete, downloadable and reproducible curriculum as well as related resource materials and an implementation guide. *Design and Discovery* is an

academic enrichment opportunity that engages students in hands-on engineering and design activities intended to foster knowledge, skill development, and problem solving in the areas of science and engineering. *Design and Discovery* is most appropriate for informal

education settings with extended blocks of time.

<http://www.intel.com/education/design/>



Grants for Manufacturing Camps

FMA FOUNDATION and the Nuts, Bolts, & Thingamajigs Foundation. While improvements in technology have increased efficiency rates and reduced the amount of unskilled labor needed, there is an ever-increasing demand for highly skilled professionals such as engineers who can design, program, and operate technology being employed.

The purpose of manufacturing camp grants is to provide a positive, hands-on experience so young people will consider manufacturing as a future career option. Grant funds may be used for the expenses related to curriculum development and instruction, as well as direct expenses such as housing, meals, transportation, and supplies.

<http://www.nutsandboltsfoundation.org/>



The Lemelson Center

for the Study of Invention & Innovation

Lemelson Center educators have developed resources for teachers, parents, and students who want to explore the exciting world of invention. These materials are provided **free** of charge to educators in the classroom and the home. Resources include...

- Educational materials
- Fellowships and grants
- Internships and travel
- Online articles
- Invention databases
- Videos
- Books
- And much more!



<http://invention.smithsonian.org/home/>



TryEngineering.org is a resource for students (ages 8-18), their parents, their teachers and their school counselors.

This is a portal about engineering and engineering careers, and we hope it will help young people understand better

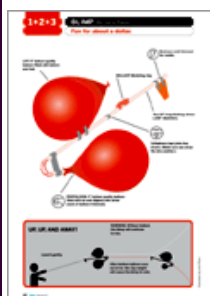
what engineering means, and how an engineering career can be made part of their future.

Students will find here descriptions of the lifestyles and experiences of engineers, and on the different disciplines within engineering.

We provide hands-on experiments and activities, referrals to summer programs and internship opportunities, and search tools for schools that offer engineering programs.

Useful tips on course selection, applying to university programs and financial aid are included

<http://www.tryengineering.org/home.php>



How Tunes: Blimp
Make your own blimp for about a dollar.

Make a Mini-Motor Turn electricity into motion with just a couple of safety pins, a battery, a magnet, and some insulated copper wire.

Make:

technology on your time

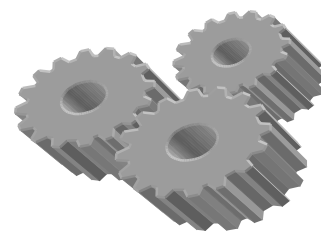


1-2-3: Das Bottle Dive!
Dive!
Dive!



Build a Nocturnal Robot using paper clips, guitar strings, rubber bands, heat-shrink tubing and your imagination.

<http://makezine.com/designsquad/>



Dream It Do It

YOUR FUTURE IS HERE FOR THE WORKING.

Dream It Do It

The Story behind the campaign **The National Association of Manufacturers (NAM)** started to hear from its members that, despite layoffs during the last recession, manufacturers were still having trouble attracting employees with the right mix of skills in certain job functions to meet the demands of modern manufacturing. To learn more, NAM and Deloitte & Touche conducted extensive quantitative and qualitative research across the U.S. The findings?

We learned that an estimated **80 percent of manufacturers** reported a "moderate to serious" shortage of qualified job applicants during the recent recession. The research also found that manufacturing has an outdated image filled with stereotypes of assembly line jobs that has kept young people from pursuing careers in this sector.

<http://www.dreamit-doit.com/>



Learningscience.org is a free and open learning community for sharing newer and emerging tools to teach science. There are many resources and lessons that may be of interest for teachers of Science, Technology, Engineering and Mathematics.

<http://www.Learningscience.org/>



Instructables.com is the world's biggest "show and tell" on how to design and build darn near anything.

<http://www.instructables.com/home>



THINGS TO MAKE & DO
Resources, projects, videos and more from the Creative Science Centre

<http://www.creative-science.org.uk/MAKE.html>



Tech Directions also offers On-Demand Classroom Projects, available via the Internet. The On-Demand Classroom Projects will help students really understand the principles of technology and

engineering. Examples include Cardboard Chair Design, Egg Bungee Jump, and A New Twist to Bridge and Tower Building. And we've done all the prep work for you! Simply print and use them in your classroom. They

are inexpensive activities that make learning fun. Guaranteed to score big points with your students! Visit the web site for more information.

<http://www.techdirections.com/>



A World in Motion

Is a FREE innovative, hands-on, minds-on curriculum offered by the **SAE Foundation for Science and Technology Education.**

A World In Motion, now in its 17th academic year of distribution, makes the challenges of math and science exciting by bringing authentic engineering design experiences into the classroom. The AWIM program is comprised of a series of four curricula referred to as challenges for students in grades 4 - 10.

Instructional challenges include:

- The skimmer jet
- Electric cars
- Glider Aircraft
- Electricity and Electronics

<http://www.sae.org/>



Free IZZIT Educational Videos

All we ask in return is for you to submit a simple online Video Feedback Form once you have used the video.

<http://www.izzit.org/videoclub/index.php>

Would you like to receive a free DVD every year for as long as you teach?

To get your own free DVD, go to <http://www.izzit.org> Sign up now to receive a free DVD from izzit.org.

There is no cost to you.



EDISON
The Charles Edison Fund

The Charles Edison Fund is providing science teaching kits outlining simple, proven experiments to teachers throughout the United States. They are constantly updated and, to date, over 60,000 kits have been distributed. They appeal to simplicity, are in

an attractive loose-leaf binder and contain instructions which can be xeroxed easily thereby permitting a teacher to copy any of the 82 experiments for classroom use by students. As a philanthropic, charitable foundation, **the Fund distributes these kits free (except for a \$1.00 handling charge) for grades 4 through junior high.** The Fund's motto is "Keep it Simple" providing

the 1-2-3 in basic science experiments which last forever and is never out of touch with current knowledge of science education needed by everyone, past, present and future. Based on its database, the Fund estimates that over 15 million students have used these kits.

<http://www.charlesedisonfund.org/thefund.html>

Shell Provides Educators Resources, Lessons, Activities and Downloads

Find



activities, worksheets and interactive modules to **"Energize Your Future"**

http://www.shell.com/home/content/usa/responsible_energy/educationenergize_your_future/education_index.html



KidWind is a non-profit dedicated to improving the quality and quantity of wind energy science education throughout the US. We promote the inclusion of wind energy in classrooms through 1 to 4 day workshops where teachers can get their hands on wind energy activities and lessons!

<http://www.kidwind.org/>



Basket Bots!

Playing Basketball With Hydraulically Operated Robots! Your challenge is to design a robotic arm that will lift a ping pong ball from a storage area to a basket located 12" off the ground. You will only be able to use the materials provided and you will have a limited time frame to complete the task. Each member of your group needs to participate in each step of the process. Points will be

awarded each time a team correctly completes a stage in the process. If a team fails to correctly complete a step, they must redo that step. See the project

[http://
www.newton.k12.ma.us/
bigelow/
engineering_technology/
curriculum/pdfdownloads/
bioengineering_student.
pdf](http://www.newton.k12.ma.us/bigelow/engineering_technology/curriculum/pdfdownloads/bioengineering_student.pdf)



Free student IMSTEA Memberships!

Students may become a member of **IMSTEA** for FREE. IMSTEA supports and promotes increased literacy in mathematics, science, engineering and technology in Indiana.

Educator and professional membership in IMSTEA

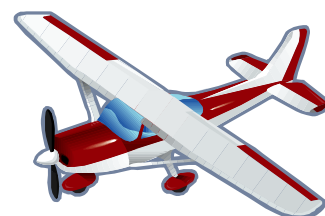
only cost \$25.00 for each year. Membership dues are used to help defray the cost of the Indiana Super Mileage Challenge and other IMSTEA activities, such as workshops, conference programs in integrated math, science, engineering and technology.

We can't do it without your help.

Free memberships are open for high school and college students.

For more details, please visit:

<http://www.imstea.org/>



PLANE Math

Plane Math

This is the PlaneMath Activities Main Page. You can go directly to a lesson, get some help to get started, check out other great places on the Web, or have your teacher/parent learn how to use this site.

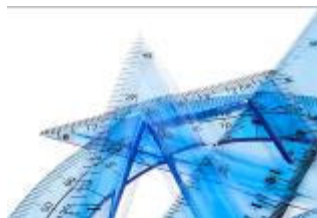
[http://
www.planemath.com/
/planemathmain.html](http://www.planemath.com/planemathmain.html)

SolidWorks STEM Grant

The SolidWorks STEM Grant is a 30 hour online course that includes the SolidWorks Curriculum and Courseware DVD which contains Powerpoint Slides, exercises and projects.

Courseware More than 500 pages of reproducible resources help you teach a wide variety of design-related topics, including design validation and data management.

To see a curriculum overview, click on the level you teach.



Resources for Middle School, High School, Technical/Vocational, College/University and more!



[http://
www.solidworks.com/sw/
education/teaching-
resources-mechanical-
engineering.htm](http://www.solidworks.com/sw/education/teaching-resources-mechanical-engineering.htm)

Free water rocket software.



This program can help students

understand the physics of water rockets and how to optimize their water rocket to obtain the highest apogee. Don't be fooled by the program's simple layout, few simulators are as accurate. Under the hood,

this program is pretty sophisticated. The methodology includes both incompressible and compressible fluid mechanics along with a fair amount of thermodynamics and numerical methods to provide accurate water rocket apogee predictions.

Free download at:

<http://www.seeds2learn.com/rocketSoftware.html>



The Virtual Astronaut is a learning environment where student may learn what it is like to be a real Astronaut! The Virtual Astronaut Learning

Environment is an interactive 3-D website that integrates existing life science research data and NASA educational products into a suite of instructional materials. It provides students and educators with an interactive tool that integrates leading-edge technology with recent findings in physical sciences, space sciences, space medicine, biomedical research and living in space.

Features include:

- Teacher resources
- Text only resources
- Related NASA links

<http://virtualastronaut.jsc.nasa.gov/>



Science Toys

Make toys at home with common household materials, often in only a few minutes, that demonstrate fascinating scientific principles.

<http://scitoys.com/>



Join the ITEA Design TIG

This forum is dedicated to those interested in the topic of design. As a member of this community you can post topics, communicate privately with other members, respond to

polls, upload content, and access many other special features.

In this Design TIG, you can discuss issues regarding curriculum, research, sample projects, and anything else related to design.

These forums were created for the purpose of sharing information, advancing education, and creating progress in the study of technology, innovation, design, and engineering education.

Non ITEA members may join any one TIG at no cost. ITEA members may join as many TIGs as desired.

Moderator - Scott Warner, Millersville University

<http://www.iteaconnect.org/Networking/technologyinterestgroups.htm>



The AMA Web Wings is a resource to support teachers and students in learning the basics of flight. The Web Wings website uses Single Concept Learning Modules (SCLMs) to teach scientific principles relating to flight. Each SCLM consists of Pre Lab, In Lab and Post Lab areas.

Modules of Instruction

Include: The Bernoulli effect, The history of aviation, gravity and weight, Bernoulli vs. Newton, thrust, drag, wings and tails, construction materials, measuring lessons, air pressure, and build your own model airplane.

<http://www.bsu.edu/web/academy/webwings/>

Energy Kid's Page

The U.S. Department of Energy Kid's Page The Energy Information Administration hosts a website with a variety of information and activities about energy. The teacher guide provides extension activities for using the Energy Kid's Page as a resource.

<http://www.eia.doe.gov/kids/>



The Ruler Game is a free/inexpensive resource which challenges students on how to read a ruler. Reading a ruler is a valuable skill that you will likely use on your job, in your hobbies, and in your personal every day life. Without measuring devices like rulers, and people that can read them, we would still be living in caves.

<http://www.rickyspears.com/rulergame/index.html>



Join the ITEA Energy-Efficient Vehicles TIG

This forum is dedicated to those interested in the topics associated with the designing, fabricating, and competitions related

to energy-efficient vehicles such as: Electrathon, Supermileage, and any other competitions dealing with these types of vehicles. All individuals are invited to join ITEA's Technology Interest Groups (TIG). TIGs are designed to facilitate dialogue between professionals with an interest in specific technological issues or initiatives. These forums were created for the

purpose of sharing information, advancing education, and creating progress in the study of technology, innovation, design, and engineering education. Non ITEA members may join any one TIG at no cost. ITEA members may join as many TIGs as desired.

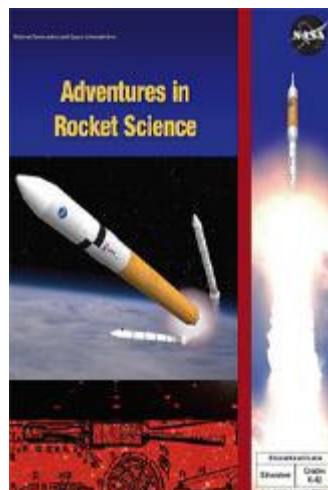
<http://www.iteaconnect.org/Networking/technologyinterestgroups.htm>

The "Adventures in Rocket Science Educator Guide"

is now available for download from the NASA website. The material was tested in a workshop pairing NAR members in the MSFC area with informal educators from science centers, 4-H clubs, Girl Scout troops and after-school programs to introduce the groups to how to use the guidebook with students

in informal settings. The Guide has activities for grades K-12 and serves as a program to progressively prepare students for participating in TARC.

http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Adventures_in_Rocket_Science.html



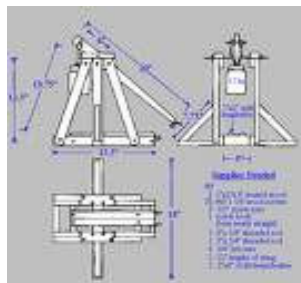


Program on Teaching Innovation

The **teaching of U.S. and world history** is incomplete if it does not address the history of **innovation** from economic, **scientific/technological**, and socio-logical perspectives. We feel it important for students to be encouraged both to explore the role of innovation in U.S. and world history and to develop their own sense of innovation and creativity.

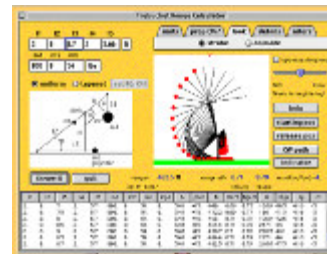
<http://www.fpri.org/education/innovation/>

The Algorithmic Beauty of Trebuchets has versions of this fine simulation of a hinged-bucket trebuchet to suit almost everybody's computer situation and computing inclinations.



This style of trebuchet is the traditional one powered by a box-of-rocks hanging from the short end of the beam. This is probably the best simulator for traditional trebuchets available.

www.algoeautytreb.com/



The Rough Science hand-cranked generator
The Rough Science hand-cranked generator showing the induction coils (each 1000 turns of

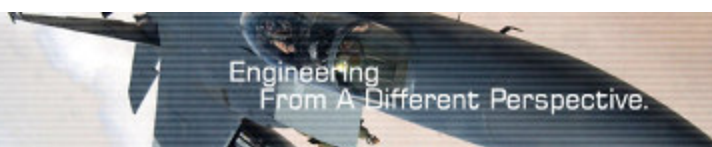
thin enamelled wire), magnets (x4) and the homemade gear mechanism / crank (far right). Two magnets, one either side of the crank shaft will work well but if you have space then you can double up to 4 as I have done here to get more electricity.

<http://www.creative-science.org.uk/rshandgen.html>



Algebasics is a fine online mathematics instructional resource that takes young and old alike through the basics of algebra, and shows you how, step by step.

www.algebasics.com



Earn up to \$200 for Your Science and Math Programs. Support may be on the way for your classroom budget.

As an **AIAA Educator Associate**, you're invited to apply for a Classroom Grant from the AIAA Foundation. Here's how it works. Are you a K-12 teacher who develops or applies science, mathematics, and technology in your curriculum? If the answer is

"yes," you may qualify for a grant of up to \$200 per individual request to supplement your learning program. Each school is limited to up to \$1,000 per calendar year. So Many Activities You Can Support Use your grant for classroom demonstration kits and science supplies, math and science software, graphing calculators, supplies for

making flying objects (what kid can resist the chance to build and launch a rocket?), supplies for robotic programs, and other materials to help you make science, mathematics, and technology come alive in your classroom.

www.aiaa.org

NASA

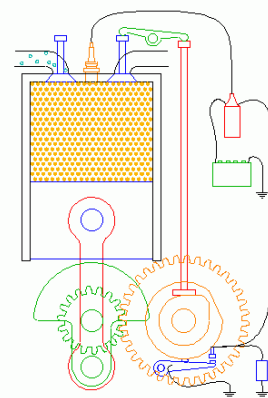
Exploring the Extreme!



With some simple inexpensive materials, you can mount an exciting and productive unit for children that incorporates science, mathematics, and technology education. The many activities contained in this teaching guide emphasize hands-on involvement, prediction, data collection and interpretation, teamwork, and problem solving. The guide also

contains background information about aeronautical research that can help students learn how airplanes fly.

[http://
teacherlink.ed.usu.edu/
tlnasa/units/index.html](http://teacherlink.ed.usu.edu/tlnasa/units/index.html)



Copyright 2000, Keveney.com

Animated Engines provides you with animated illustrations that show the inner workings of a variety of engines. This web site began life as an experiment in web publishing, but has grown more and more focused on animated engines.

Animated Engines features the inner workings of:

- Internal combustion engines
- Steam engines
- Stirling engines
- And much more!

[http://
www.keveney.com/
Engines.html](http://www.keveney.com/Engines.html)



Free AIAA Curriculum Materials

FREE AIAA curricula. The following curricula are some of the most requested by teachers over many years. These were not created by AIAA, but we felt that they would have value to teachers and so have made them

available in pdf format. Some of this curriculum has come from educational partners or has been passed along as a favorite.

We hope that these materials will help you excite your students about math and science in a new way!

[http://www.aiaa.org/
content.cfm?
pageid=473&vupage=cl
_curriculum](http://www.aiaa.org/content.cfm?pageid=473&vupage=cl_curriculum)

The Alan Shepard Technology in Education Award is open to all K-12 school or district level educators from across the nation. The Award will be presented by AMF, the Space Foundation and NASA at the 26th National Space Symposium in Colorado Springs, Colorado (The



Award will be presented on April 12, 2010). The winner will be flown to Colorado Springs, where hotel accommodations will be provided. The winner will receive a commemorative trophy with his or her name engraved and a monetary award of \$500. In addition, the Award winner's name will be placed on a plaque honoring past recipients

that is housed in the Center for Space Education at the Kennedy Space Center in Florida.

<http://www.amfcse.org/>



Technology and Children

Receive a FREE sample of ITEA's award-winning journal for K-8 technology education!

<https://www.iteaconnect.org/Forms/freeT&C.htm>



Free Teacher Downloads - Take advantage of our field experience in educational rocketry by using the set of free online resources

<http://www.nar.org/teacher.html#REE>



NAR Email Education Newsletter and Teacher CD-ROM - Would you like to have a rocketry program at your school or know more about how to use rockets to teach math and science?

Please take advantage of our field experience in educational rocketry by completing our survey. That signs you up for both our Email Educator Newsletter, and our free Rocketry Resource CD-ROM (available to educators and youth leaders in the US and Canada only). You and your students will be "go for launch."

<http://www.nar.org/teachercd.html>



How to Build and Fly a Model Rocket"

Three years ago the NAR and the Aerospace Industries Association

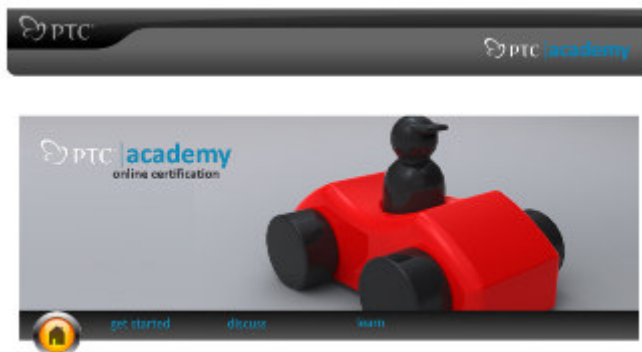
produced a one-hour instructional video "How to Build and Fly a Model Rocket" in support of student teams in the Team America Rocketry Challenge student rocketry contest, an annual national event that the two organizations co-sponsor.

Originally available only in DVD form to teams enrolled in this competition, this useful resource is now available on YouTube to anyone who wishes to use it in teaching rocketry.



<http://www.youtube.com/user/AerospaceIndustries>

FREE! PTC Pro/Engineer Academy

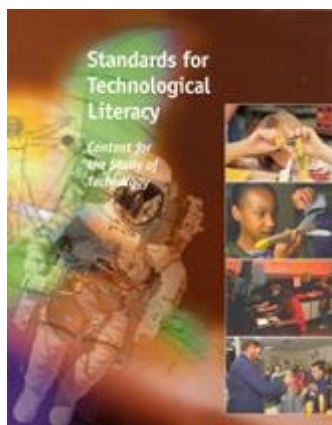


PTC Pro/Engineer Academy

Welcome to the PTC/Academy learning portal. Here you will find self

directed and self paced tutorials to get you started using your FREE Pro/ENGINEER wildfire 4.0 license. **If you are an educator:** Why not complete the 'get started' module and apply for online certification! Formal accreditation allows you to obtain a 300 seat license to teach Pro/ENGINEER in your School!

<http://www.ptccademy.com/>



The STL identifies *content** necessary for K—12 students, including *knowledge**, abilities, and

the capacity to apply both to the real world.

The standards in *STL* were built around a *cognitive** base as well as a *doing/activity** base.

They include *assessment** checkpoints at specific grade levels (K—2, 3—5, 6—8, and 9—12). *STL* articulates what needs to be taught in K—12 *laboratory-classrooms** to enable all students to develop technological literacy.

The *goal** is to meet all of the standards through the *benchmarks** which are included in *STL*.

Standards are written statements about what is valued that can be used for making a judgment of quality.

<http://www.iteaconnect.org/TAA/PDFs/xstnd.pdf>



Design Squad Resources!

Here's where you'll find everything you need to know about the DESIGN SQUAD program and Web site. Plus you can find tons of fun engineering activities you can do at home, in the classroom or with any group of kids!

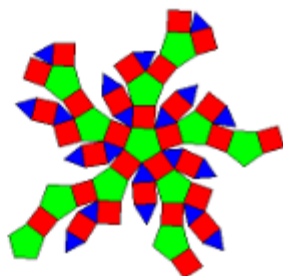
http://pbskids.org/designsquad/parentseducators/printable_resources.html



2D - 3D

Poly is a shareware program for exploring and constructing polyhedra.

With Poly, you can



Net

manipulate polyhedral solids on the computer in a variety of ways. Flattened versions (nets) of polyhedra may be

printed and then cut out, folded, and taped, to produce three-dimensional models. Poly is used in schools and homes around the world.

<http://www.peda.com/poly/>

BEST PRACTICES In Technology Education



The Technical Foundation of America convened teams of technology educators in 2004 and 2005 for the purpose of identifying "Best Practices" in technology education.

This FREE book identifies and briefly describes selected Best Practices as viewed by the participants of those teams.

This book provides a snapshot of the combined list of best practices that resulted from the 2004 and 2005 sessions.

<http://teched.vt.edu/ctte/ImagesPDFs/BestPracticesInTE.pdf>



Challenge of Materials

A gallery and website all about materials, from the Science Museum, London.

<http://www.sciencemuseum.org.uk/>

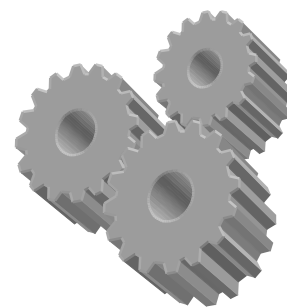
How Everyday Things Are Made!



Ever wonder how things are made? - if you are been interested in manufacturing processes, like forging, casting, or injection molding, then you've come to the right place!

AIM has developed an introductory website for kids and adults showing how various items are made. It covers over 40 different products and manufacturing processes, and includes almost 4 hours of manufacturing video.

It is targeted towards non-engineers and engineers alike. Think of it as your own private online factory tour, or a virtual factory tour.



<http://manufacturing.stanford.edu/>

Careers in Materials Our mission here is to give you an insight into the exciting world of Materials Science, and the opportunities. Our website is packed with information and resources on all aspects of the subject, including interactive games and quizzes, career options and case studies from our industry friends.

<http://www.materials-careers.org.uk/>



Free Student Aware Safety Posters!

The **Student Aware** free web site welcomes and celebrates technology education teachers. For over 20 years Student Aware has been providing America's technology

education teachers with free shop-safety and other free supplemental classroom materials.

This web site has been especially designed for high school teachers and their vocational education, shop, or technology education students.

If you're new to our *Technology Education* program, click on the Free Posters, Materials & Survey link to order your free shop safety

materials. If you already receive *Technology Education* shop-safety materials, please be sure to complete the online Reorder/Surveyor the one wrapped around the *Teachers' Newsletter* you received in September.

To receive up your free posters and materials please visit:

<http://www.teched101.com/>

Space Math I

The problems in this booklet investigate space weather phenomena and math applications such as solar flares, satellite orbit decay, magnetism, the Pythagorean Theorem, order of operations and probability. The problems are authentic glimpses of modern engineering issues that arise in designing satellites to work in space. Each word problem has background

information providing insight into the basic phenomena of the sun-Earth system, specifically space weather. The one-page assignments are accompanied by one-page teacher guides with answer keys.

http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Space_Math_I.html



Center for Technological Literacy



The Hofstra University Center for Technological Literacy Supports the advancement of technological literacy for students in grades K-16. The interaction of school districts to provide support services in a variety of ways, through sabbatical leaves in industry for teachers, outreach programs, special seminars for teachers, administrators and guidance counselors. Additionally it supports the establishment of advisory committees to help translate goals into specific objectives, such as summer programs for students and teachers to improve the study of Math Science and Technology.

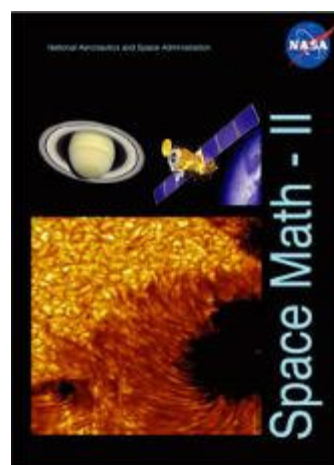
http://www.hofstra.edu/Academics/SOEAHS/TEC/index_TEC.cfm

Space Math II

The problems in this booklet investigate science and math concepts such as solar energy, stars, scientific notation, and distance, rate and time. The problems are authentic glimpses of modern engineering issues that arise in designing satellites to work in space. Each word problem has background

information providing insight into the basic phenomena of the sun-Earth system, specifically space weather.

http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Space_Math_II.html

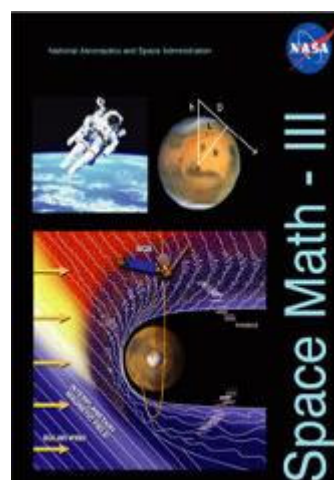


Space Math III

The problems in this booklet investigate science and mathematics concepts such as radiation effects on humans and technology, solar science, algebra, trigonometry and calculus. The problems are authentic glimpses of modern engineering issues that arise in designing satellites to work in space. Each word problem has background

information providing insight into the basic phenomena of the sun-Earth system, specifically space weather. The one-page assignments are accompanied by one-page teacher guides with answer keys.

http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Space_Math_III.html



The Fabricators & Manufacturers Association Foundation serves as an educational, research, and charitable organization.

<http://www.fma-foundation.org/index.cfm>

Microsoft Expands FREE DreamSpark Program for HS students



Microsoft Corporation recently announced the expansion of the successful Microsoft DreamSpark student program to include high school students worldwide. DreamSpark,

originally available only to university students, makes professional-level developer and designer tools as well as training available to students at no charge to support and advance their learning and skills through technical design, technology, math, science, and engineering activities. Here's how it

works: if you're a current university or high school student, you can download professional Microsoft developer, designer, and gaming software through DreamSpark at no charge!

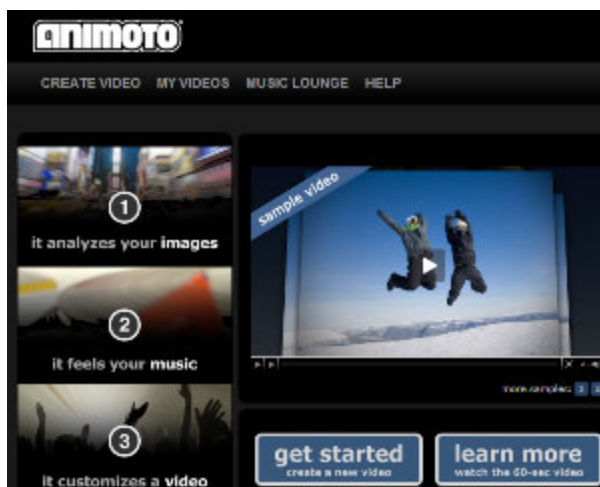
[https://
www.dreamspark.com/
default.aspx](https://www.dreamspark.com/default.aspx)

ANIMOTO

ANIMOTO

Animoto for Education was designed to support the unique needs of educators, and it's loaded with features that make it easy to create powerful, professional video in minutes.

<http://animoto.com/>



ties magazine supports technology education and the integration of math, science and technology curriculum mainly in middle, junior and senior high schools. While elementary is not our focus, we do support them and show examples of good elementary practices. We emphasize design and problem solving as an instructional technique.

[http://
www.tiesmagazine.org/](http://www.tiesmagazine.org/)



Join the Women in Technology TIG – This forum is dedicated to those interested in the topics of recruiting and retaining women and girls in the areas of Science,

Technology, Engineering and Mathematics (STEM).

In the Women in Technology TIG, you can discuss issues regarding curriculum, research, educational games and toolkits, sample projects, and anything else related to women and girls in technology.

These forums were created for the purpose of sharing information,

advancing education, and creating progress in the study of technology, innovation, design, and engineering education. Non ITEA members may join any one TIG at no cost. ITEA members may join as many TIGs as desired.

[http://
www.iteaconnect.org/
Networking/
technologyinterestgrou
ps.htm](http://www.iteaconnect.org/Networking/technologyinterestgroups.htm)



BUG BOT! Want to add some robots to your Halloween party plans? Even better, how about some robot "bugs" dancing around the candy bowl?

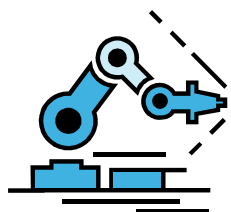
Then Boo, the light-loving

bug bot, might be for you. this bug robot can be easily built for less than ten bucks (or free if you have some spare parts in your workshop). Self-contained within a discarded DB-9 serial hood, Boo waits passively until some bright light catches its eye. Then it's show time!

The illumination triggers a tiny vibrating motor embedded in this bot's abdomen, and it's off to

the races. If the jig the bug dances is not your cup of tea, slip a rubber grommet over the hub of the motor's spinning weight to give Boo some cockroach speed.

<http://www.popsci.com/diy/article/2008-10/boo-bug-bot>



Welcome to the Woodshop Safety for students web site

This site was developed to help you learn how to protect yourself from different hazards that you will encounter as you begin working in the shop at your school.

<http://www.uvworksafe.com/woodshop/default.shtml>



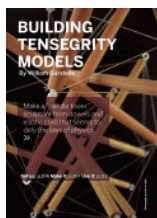
Make a Frankenmouse
Transform a mild-mannered computer mouse into a rolling robot.



Fly an Ornithopter
Build a rubber-band powered bird-like aircraft with wood, wire, tissue and glue.



Make a Cigar Box into a Guitar with a cigar box, twine, wood, screws, bolts.



Build a Tower to the Sky
Make a kinetic sculpture using dowels held in place by the tension of plastic cords.

<http://makezine.com/designsquad/>

Make:
technology on your time

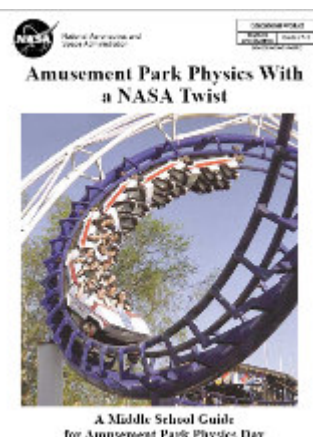
Amusement Park Physics With a NASA Twist

Amusement Park Physics With a NASA Twist

Most amusement park physics guides focus primarily on problem sets and are geared towards using trigonometry and calculus. This is a middle school guide that makes the NASA connection to the rides. All of the activities are centered on preparing students to complete worksheets for specific rides.

The science and mathematics teachers can prepare students to use a single method or several methods for gathering the data.

http://exploration.grc.nasa.gov/physicsday/physics_nasatwist_guide.pdf





Donors Choose is a not-for-profit web site where teachers submit project proposals for materials or experiences for their students that are granted from donors.

<http://www.donorschoose.org>



This web site features resources and support to help YOU communicate with your students the steps to becoming a Technology teacher!

Technology Education is an exciting and rewarding profession. Technology teachers, like all teachers,

share with their students what needs to be known to be a successful member of society. But Technology teachers also teach their students more in-depth methods of learning and thinking, along with important skills that will help them out in their future.

<http://www.teachtechnologyeducation.com/>



Join the ITEA Technology Student Association TIG

This forum is dedicated to those interested in the topic of the Technology Student Association.

In this TIG, you can discuss issues regarding leadership curriculum, competitive events, encouraging student leaders, current products, and anything else related to the Technology Student Association.

These forums were created for the purpose of sharing information, advancing education, and creating progress in the study of technology, innovation, design, and engineering education.

Non ITEA members may join any one TIG at no cost. ITEA members may join as many TIGs as desired.

<http://www.iteaconnect.org/Networking/technologyinterestgroups.htm>



Discover Engineering

Resources include lessons, career profiles, videos, articles, games, activities, downloads and more!

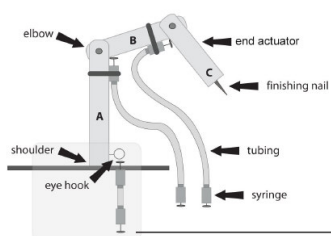
<http://www.discoverengineering.org>

Be sure to tune-in to **Design Squad**, the new PBS reality engineering competition series. Many local public television stations are broadcasting **Design Squad**.

<http://pbskids.org/designsquad/>



Hydraulic & Pneumatic Robot Arm!



There are many types of robots. Some do more detailed work, like microsurgery that requires exact precision. Some do heavy lifting, like arms

that lift cars. Some need to move things fast and some need to move things slowly and carefully. Machines that require movements in short, very fast, bursts often use air pressure, called pneumatics. Moving very heavy loads often requires a more dense fluid than air, so they use a liquid. We call this hydraulics. There are 6 typical robot motions – rotate, rise, fall, twist, open, and close.



[http://
www.montshire.org/
teams/teams3/here-to-
there/
program_materials/
robotic-arm.pdf](http://www.montshire.org/teams/teams3/here-to-there/program_materials/robotic-arm.pdf)



Imagine colleagues and friends sharing information, activities, challenges, solutions, philosophy, and experiences...

Innovation station is a listserv that gives technology education professionals an opportunity to share ideas and interact with each other on topics of mutual interest. Lead by leaders in the field... Best of all it is free!

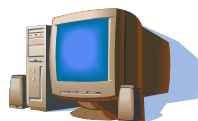
www.iteaconnect.org



Indiana Surplus Computer Program

Indiana State Surplus must first offer educational entities the opportunity to bid on State owned surplus computers. The educational entity must be accredited, licensed, or certified by the Indiana Department of Education to qualify for this program.

The educational entity must submit their bid on letterhead and attach a copy of their accreditation, license or certification. The letter of request must state the type of computer, the quantity and the amount bid for each unit. A unit consists of hard drive, monitor, keyboard, mouse and hookup cables.



Orders are filled on first come, first serve basis. Once the order is filled, the entity will be called to schedule pick up. The educational entity must bring full payment in the form of a check from the entity's account. Nonprofit entities must pay with a money order. To learn more visit:

[http://www.in.gov/idoa/
surplus/general/
computer.html](http://www.in.gov/idoa/surplus/general/computer.html)

NSF Teams with NASCAR TO Reveal "The Science of Speed"

Educators have a new way to engage students in grades 8-12; they can turn to NASCAR. A new online series of videos called "The Science of Speed" teaches science by revealing the sophisticated science and engineering underlying NASCAR racing. "By exploring the range and depth of science that goes into something as wildly popular as NASCAR, we hope to harness the

passion of its fan base and reignite interest in science and engineering among teachers and students," says Jeff Nesbit, director of the National Science Foundation's (NSF) Office of Legislative and Public Affairs, the organization that spearheaded the project. In the 12-module science video series, fast cars double as science experiments that illustrate basic concepts of friction,

safety, sound, and other elements of racing at speeds up to 200 miles per hour. Through the videos, NSF seeks to enhance students' critical thinking, problem solving, and innovative use of knowledge for next generation applications.

[http://
www.science360.gov/](http://www.science360.gov/)





Traffic Game Lets High School Students Dabble In Engineering, Transportation

The University of Minnesota has developed an online traffic control game that gives high school students a chance to try their hand at working in the engineering and transportation fields.

Gridlock Buster, as the game is titled, "was developed by the university's Institute of Transportation Studies incorporates tools and ideas that traffic control engineers use every day. In one example, a player might need to manage a high volume of traffic at an intersection, where long lines form if there's not enough green-light time." The game is available **online** at the University of Minnesota's website.

<http://www.its.umn.edu/trafficcontrolgame/>



Educator Resources

"Pay It Forward Mini-Grants"

This program funds one-time-only service-oriented projects identified by youth as activities they would like to perform to benefit their school, neighborhood, or greater community.

Projects must contain a "pay it forward" focus -- that is, they must be based on the concept of one person doing a favor for others, who in turn do favors for others, with the results growing exponentially.

Maximum Award: \$500.
Eligibility: schools, churches and community youth groups.

<http://payitforwardfoundation.org/educators/grant.html>

Food Technology Toolbox



Food Technology Toolbox

The Food Technology Toolbox is a document that provides a framework and

tools to support planned progression of Food Technology knowledge and skills from Years 7-13. The content provides a guide to assist teachers planning a Food Technology course over several years. Teachers can select appropriate knowledge and skills topics to apply to their programme to suit their students' learning and school environment.

<http://www.techlink.org.nz/Case-studies/Classroom-practice/Teaching-Practice/cp807-food-technology-toolbox/index.htm>



CryptoKids

We're the **CryptoKids** and we love cryptology. What's cryptology? Cryptology is making and breaking codes. It's so cool.

We make codes so we can send secret messages to our friends and we try to figure out what other people are writing about by breaking their codes.

It's a lot of fun. On this site, you can learn all about codes and ciphers, play lots of games and activities, and get to know each other. You can also learn about the National Security Agency/Central Security Service - they're America's real

codemakers and codebreakers.

Without NSA/CSS, they wouldn't be able to talk to one another without the bad guys listening and they wouldn't be able to figure out what the bad guys were planning. You might be part of the next generation of America's code makers and code breakers.

<http://www.nsa.gov/kids/>



The NEED Project has posting most of our Curriculum Guides online.

A recent survey of NEED teachers found that many wanted more access to electronic versions of our guides to save paper, shipping costs, and to

reduce our carbon footprint.

This page provides you with multiple ways to access the guides - By [Subject Matter](#), [Name](#), and [Grade Level](#).

Please note that some of these files are large. We want you to have the best

possible quality when you download and print a document.

The new NEED Energy Kit is also now available.

This kit contains the Teacher Guides necessary to implement a NEED program in a classroom or through extracurricular activities.

<http://www.need.org/curriculum.php>



American Institute of Aeronautics and Astronautics FREE

membership for Educators in grades K through 12 interested in the development or application of science, engineering mathematics, and technology for their curriculum.

<http://www.aiaa.org/>



Audacity is a Free, Cross-Platform Sound Editor.

and other operating systems.

Audacity is a free, easy-to-use audio editor and recorder for Windows, Mac OS X, GNU/Linux

You can use Audacity to:
Record live audio,
Convert tapes and records into digital recordings or CDs, Edit

Ogg Vorbis, MP3, WAV or AIFF sound files, Cut, copy, splice or mix sounds together, Change the speed or pitch of a recording. And more!

<http://audacity.sourceforge.net/about/>

To Survive at High Velocity!

Racecar teams look to reduce the time it takes their cars to complete a circuit. They focus most of their efforts on improving what's called cornering speed, because it's in the corners, where cars must reduce speed, that precious time is lost. Using a mix of practice lap and actual race footage, this video segment, adapted from



NOVA, highlights the forces at work on a racecar as it travels around a track.



<http://www.teachersdomain.org/resource/phy03.sci.phys.mfw.velocity/>

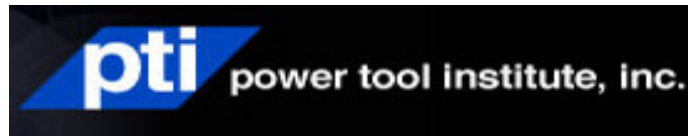


FreeSignage.com

Free printable OSHA and statutory signs!

The introduction of free-signage is the latest in a series of innovative projects which involve the use of internet based software, developed by the company's engineers, being made universally available all internet users, bringing professional typography and graphic design to all.

http://www.freesignage.com/warning_signs.php



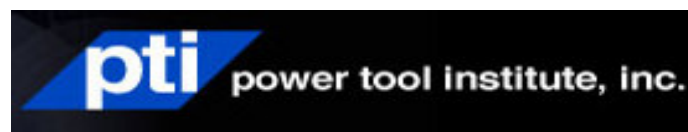
Safety is Specific — a 24-page illustrated brochure which includes a straightforward compilation of rules and safe practices for each category of power tool use (specific cautions, warnings and dangers). The guidelines discuss the safe operation of widely used portable and stationary tools. *FREE*

A Teacher's Reference Guide to Power Tool Safety (Includes a copy of all publications and the Combination DVD in English) - provides lesson plans, student activities and quizzes, support materials, and references to additional information on each power tool category. *FREE.*



On the Job Power Tool Safety Maintenance Check List — a 1-page check list of 11 items including owner's manual, cord sets and extension cords, switches, tool holding devices, guards, housings, adjustments, blades and bits, maintenance, mechanical operation and electrical safety. No Charge.

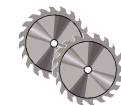
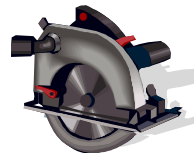
<http://www.powertoolinstitute.com/education.html>



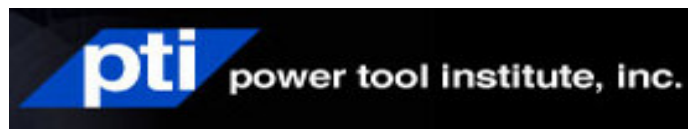
Power Tool Safety — a 4-page, cartooned brochure consisting of recommendations for the safe use of portable and stationary powertools on the job or at home. *FREE*

<http://www.powertoolinstitute.com/education.html>

Safety Poster — Mr. Power Tool Safety Says "Prepare for the job, dress for the job and perform the job with SAFETY in mind!" *FREE*



Power Tool Accidents — They Can Be Prevented — a 19-minute video which addresses the importance of keeping the work area safe, electrical safety, developing good personal work habits and proper tool use and care. Includes interviews with emergency room physicians, people injured while using power tools and PTI safety experts. — No Charge

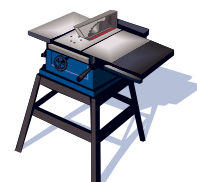


Circular Saw Safety — a 25-minute video which addresses the importance of keeping the work area safe, developing good personal work habits while using circular saws. — *No Charge*

Table Saw Safety — a 19-minute video which addresses proper workspace setup, the basics of making cuts, general safety procedures and proper maintenance. — *No Charge*

Miter Saw Safety Video — a 15-minute video which addresses safety procedures when using a miter saw. — *No Charge*

<http://www.powertoolinstitute.com/education.html>

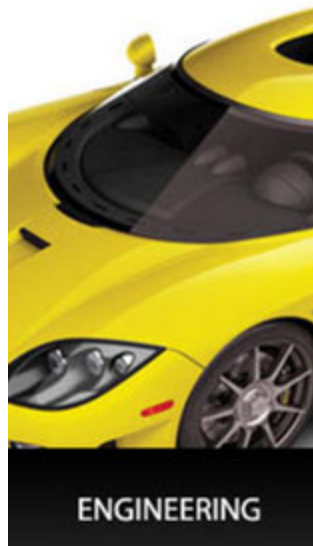
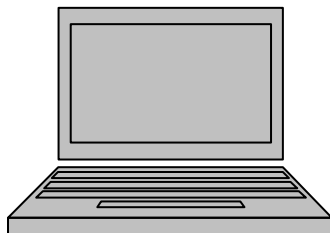


The CAD Academy

The CAD Academy is a premier pre-engineering, pre-architecture and interdisciplinary academic program. The CAD Academy advances education in the key areas of STEM and architecture while allowing students to explore career paths through real-world projects. The CAD Academy empowers K-12 instructors to prepare the next generation of engineers, architects and design professionals through the implementation of industry-

leading software, project-based curriculum and instructor training. To request an evaluation copy visit here:

[http://
www.thecadacademy.com](http://www.thecadacademy.com)



Shop Rat

The Shop Rat Foundation is dedicated to offering hands on skilled trade programs to our youth and generating the next generation of Shop Rats. The Shop

Rat Foundation created the Shop Rat Education Program, a private after school and weekend program that teaches local middle school students many skills in skilled trades along with key skills in math, science, team work, work ethic and employability. We recognize the need to develop well planned programs that provide an opportunity to expose young Shop

Rats to a variety of careers that utilize their minds and their hands.

[http://
www.shoprat.org/](http://www.shoprat.org/)



The Tornado Project a number of different "model" tornadoes that can be made very easily and inexpensively at home.

Most are made with items you already have around the house, or are readily available at a hardware or discount store.

These are easy to build!

[http://
www.tornadoproject.com/cellar/workshop.htm](http://www.tornadoproject.com/cellar/workshop.htm)

Also see:

[http://
www.facethewind.com/
tornsim/tornsim.html](http://www.facethewind.com/tornsim/tornsim.html)



Lessons from the Salvadori Classrooms

Developed over two decades, integrate architecture and engineering into the core subject areas of the curriculum: science, social studies, language arts, visual arts, and mathematics.

Visitors can "test-drive" five free lessons while teachers who have attended the Salvadori Professional Development Programs or who have been mentored by the Salvadori staff.

[http://
www.salvadori.org/](http://www.salvadori.org/)





Museum of Science and Industry
In **Chicago** offers Free
on
line Activities.
Visit the website to
learn more!

[http://
www.msichicago.org/
online-science/
activities/](http://www.msichicago.org/online-science/activities/)

Hoosier Hot 50 Jobs

The Hoosier Hot 50 Jobs is a listing of the jobs most "in demand" for the state of Indiana between 2006 and 2016. By reviewing this list, Hoosiers can easily see growing occupations, average wages, education and basic skills needed for on the job success.

[http://www.in.gov/
dwd/2382.htm](http://www.in.gov/dwd/2382.htm)

METHODOLOGY

The 2009 Hoosier Hot 50 Jobs were selected based on Indiana's Occupational Projections and wage data from the Occupational Employment Statistics (OES) survey, both produced by Indiana's Department of Workforce Development. For more information on employment and wage statistics check out: www.hoosierdata.in.gov

The Hoosier Hot 50 Jobs are "in demand" now and will be in the future - with high growth and higher than average wages.

METHODOLOGY NOTES

The 2009 Hoosier Hot 50 Jobs is a list of high wage growth occupations in Indiana, ranked according to a weighted average of 7 weighted occupational measures of growth and opportunity for Hoosier workers now and in the future.

SOURCES AND MEASUREMENTS USED FOR DETERMINING THE 2009 HOOSIER HOT 50 JOBS

1. Indiana 2008-2016 Long Term Occupational Projections
2. Indiana 2008-2016 Short Term Occupational Projections
3. Indiana Occupational Employment Statistics Wage Survey (2007-2008)

Measures:
1. Long Term Growth 2008-2016 (current and percent change)
2. Short Term Growth 2008-2016 (current and percent change)
3. Long and Short Term Job Opening Opportunities (due to growth plus openings due to worker replacement)
4. Indiana 2007 OES Occupational Median Wages

BASIC SKILLS

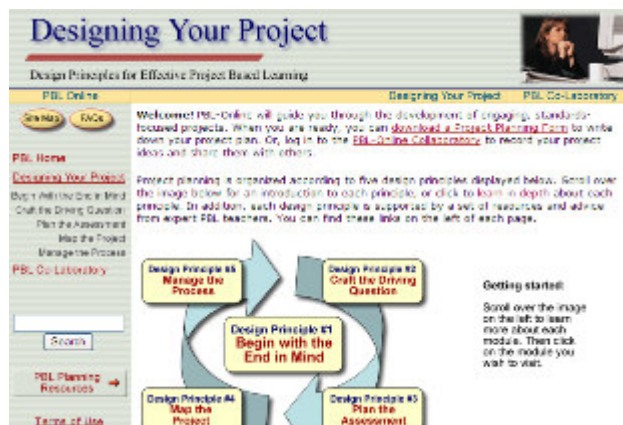
The 4 Skill Pathways illustrate the specific skills needed for success



Project-Based Learning Online

Learn how to Design your Project. Plan rigorous and relevant standards-focused projects that engage students in authentic learning activities, teach 21st century skills, and demand demonstration of mastery.

<http://www.pbl-online.org/>



Microsoft Unveils Career Resource for Students



To help middle- and high school students learn about the 21st-century jobs awaiting them and take charge of their own education, Microsoft's U.S.

Partners in Learning program has unveiled a free online course called CareerForward.

[http://
nroc.careerforward.org/
careerforward/](http://nroc.careerforward.org/careerforward/)



Adobe launches free web version of Photoshop

Adobe Systems launched a basic version of the program available free of charge online.

<https://www.photoshop.com/express/landing.html>



Children Designing & Engineering

The Children Designing & Engineering (CD&E®) Project is a collaboration of the College of New Jersey's Department of Technological Studies, the New Jersey Chamber of Commerce and the Institute of Electrical and Electronics Engineers.

With support from the National Science Foundation, project teams have developed contextual learning units for children in grades K to 2 and 3 to 5. These units challenge students to solve practical problems related to real-world settings inspired by several New Jersey

businesses. To solve these problems, the students must learn techniques and concepts of mathematics, science and technology. They must carry out investigations, generate ideas, plan a course of action, make and test things and reflect upon what they have learned.

<http://www.childrendesigning.org/home.html>



FREE DVD Bold Visions: Women in Science & Technology

Bold Visions gives us a glimpse into the lives of women who are dispelling the myths commonly associated with professionals who work in the fields of STEM by showing how engineers make a difference in our lives.

Order your FREE copy now by contacting JETS at info@jets.org.

Simply email JETS with the subject heading: "Bold Visions" and provide us with your name and mailing address.



Stuff That Works!

The Stuff That Works curriculum, captured in a series of field-tested curriculum guides produced by City College's Schools of

Engineering and Education and K-8 teachers through a prior NSF professional development materials grant, is central to the professional development experience and engages teachers in analysis and design activities arising from everyday problems and artifacts. Teachers participating in the Stuff That Works professional development project first

attend a half-day, in person, hands-on workshop that introduces them to one of the five curricular guide topics, all of which involve analysis and design — or redesign — of everyday artifacts and/or environments.

http://citytechnology.ccny.cuny.edu/Design_Tech.html



SME Videos

The society of manufacturing engineers also has a few good resources and streaming videos.



<http://www.sme.org/>

Conexus is focused on issues like workforce development. It is never too early to start thinking about your future, and the manufacturing and logistics fields offer great careers with excellent salaries helping create products from hybrid cars to MP3 players. Take the right education and training and you can both **Dream It & Do It!**

<http://conexusindiana.com>

CONEXUS INDIANA



Imagine Project The purpose of this project is for teams of students to imagine and design a vehicle of the future. It has been my experience that many students read or hear the word 'vehicle' and automatically visualize a car. My original intent was

specifically for students NOT to design a car because I wanted them imagine what the future of travel might be like. However, given the range of ages for high school students, designing a regular automobile can be quite challenging. This



project can be focused in several ways depending on your student population.

<http://www.eng.uc.edu/STEP/>



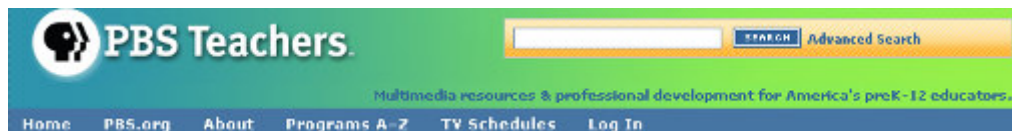
National Center for Manufacturing Education

(NCME) -- Educators can find curriculum, learning activities, nationwide events, links and web seminars focused on

enhancing manufacturing education. NCME was established through the National Science Foundation.



<http://www.ncmeresource.org/>



PBS Teachers

offer many high quality and FREE resources for teaching & learning at PBS Teachers. PBS Teachers is PBS' national web destination for high-quality preK-12 educational resources. Here you'll find classroom materials suitable for a wide range of subjects and grade levels. We provide thousands of lesson plans, teaching

activities, on-demand video assets, and interactive games and simulations.

These resources are correlated to state and national educational standards and are tied to PBS' award-winning on-air and online programming like NOVA, Nature, Cyberchase, Between the Lions and much, more.



<http://www.pbs.org/teachers/sciencetech/>



Welcome to the online version of the Design For Manufacturing Tutors

The DFM Tutors are interactive multimedia software containing a combination of text, graphics (stills and animated), and voice intended specifically for teaching design for manufacturing.

<http://mielsvr2.ecs.umass.edu/tutors/mainmenu.html>



Puzzle Cube Project

The students will be designing a puzzle cube that, when completely assembled, will be a cube. This puzzle must contain at least 5 parts constructed from wood cubes. None of the parts can be the same and each part must contain 3, 4, 5, or 6 cubes, and some of the parts must interlock. The students will

use their wooden blocks and masking tape to a create the first (of three) mock-up model of their puzzle cube. The parts for this mock-up will be drawn and dimensioned on multi-view paper and then evaluated using a decision matrix worksheet. This process will be repeated two more times. Once the three solutions are created and evaluated a final solution can be selected to be permanently glued together and colored with

markers. These parts will then be modeled and assembled using Autodesk Inventor. Next students will generate dimensioned engineering drawings from their Inventor part files. Finally, the students will compile their work into a portfolio for submission to the instructor.

<http://www.eng.uc.edu/STEP/>



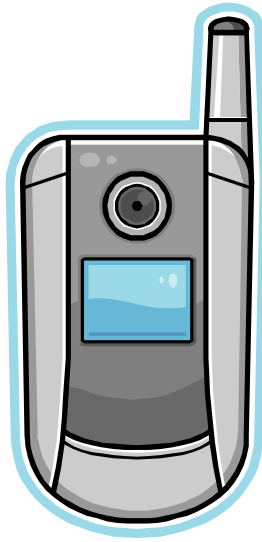
National Engineering Technology Education Clearinghouse

This site is a great resource for all technology and engineering students, faculty, and industry. Here you can find exemplary materials in the field of Engineering Technology

from course materials to journal articles in our digital library, get connected with experts and programs through our professional services, and join a virtual community with others in the field of engineering technology by participating in our online forum.

NETEC is provided as a service of NJCATE and is supported by the National Science Foundation.

<http://www.neteconline.org/>



Cell Phone Modeling It is often very helpful for engineers and designers to make quick study models of the projects that they are working on because they are too complex to sketch.

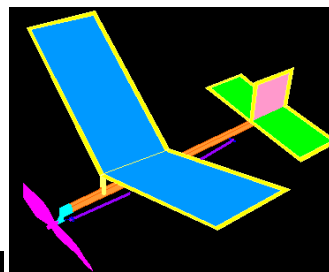
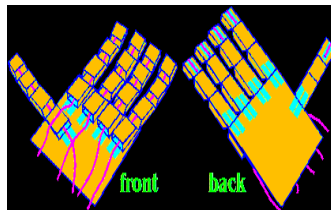
This exercise allows students to develop this skill through a more hands-

on approach. Students will learn how to make visual models of their own designs and will further be taught how to create orthographic and isometric drawings from physical objects.

<http://www.eng.uc.edu/STEP/>

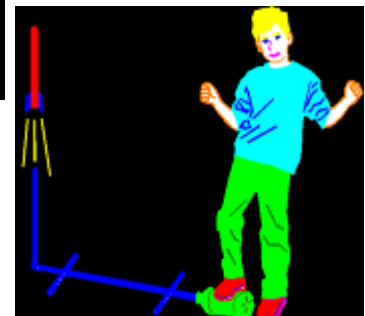
Sciencetoymaker.org

The **ROBOT FINGER** is easier to build than the ROBOT HAND and still demonstrates how tendons work.



Make rubber band powered **AIRPLANES** from scratch, even the props. They fly great.

Make an **AIR ROCKET** goes higher than the tallest trees.



Paper Roller Coasters

Create incredible paper roller coasters using strips of heavy paper. By folding, cutting, and taping the paper strips together you will be able to make sturdy roller coasters that reach the ceiling!

<http://www.paperrollercoasters.com/products.htm>

How Products Are Made

Volume 1
Volume 2
Volume 3
Volume 4
Volume 5
Volume 6
Volume 7



How Products Are Made explains and details the manufacturing process of a wide variety of products, from daily household items to complicated

electronic equipment and heavy

machinery. The site provides step by step descriptions of the assembly and the manufacturing process (complemented with illustrations and

diagrams) Each product also has related information such as the background, how the item works, who invented the product, raw materials that were used, product applications, by-products that are generated, possible future developments, quality control procedures, etc.

<http://www.madehow.com/>



Project STEP

Car Design Process The students will be given a pair of articles about the development of two upscale automobiles as well as the handout, which contains questions about the articles.

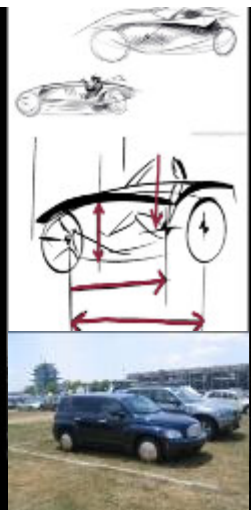
Students will learn to critically think about the differences in the design process and also be

exposed to new vocabulary and improve their reading comprehension.

More at <http://www.eng.uc.edu/STEP/>

THE DESIGN PROCESS

- It is a series of stages and check-points where each step in this process can be reviewed and analyzed.
- Modifications or refinements can be made to the concept.




Project STEP

Design Evolution

Research Project The students will be taught about the history of design after which they will be paired into teams and given current periodicals to assist them in choosing a consumer product to research. Through this activity students will learn how to carry out

research methodically and will also learn how to use PowerPoint as a visual aid for making an oral presentation.

<http://www.eng.uc.edu/STEP/>

Before the Industrial Revolution

- Cave men
 - Scratched symbols and scenes on cave walls providing us with a record of life and skills known during the Stone Age
- The Judea fortress
 - The first known floor plan of buildings to be constructed in an orderly fashion
- Objects were handmade one at a time




Project STEP

Elements of Design This activity will help the students to become sensitive to design in order to produce desirable consumer products. They will learn how to apply the theoretical knowledge they obtain in academic settings to practical endeavors. It

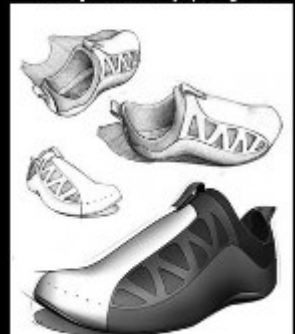
will help them work in teams, improve their oral presentation skills and learn the difference between the principles and elements of design.

<http://www.eng.uc.edu/STEP/>

STAGE 2: DEVELOP CONCEPTS

- Ideation
 - Brainstorming (words)
 - Sketching (images)
- Data collection
- Information resources

Concept sketches of cycling shoes



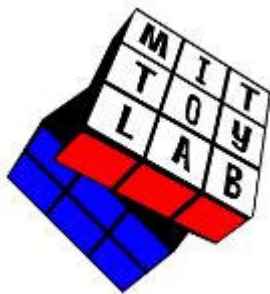


Voyages Through Time

"The Evolution of Technology" module combines investigations of these aspects of technology with student projects that illustrate them in detail. Students work in teams to complete a research project which focuses on one type of technology. Supporting materials have been provided for the teacher, including a comprehensive poster assessment rubric, as well as help in managing projects and student teams and resources that cover project-specific and general areas of technology. Materials are also provided for the student, including the rubric, research help, general resources, and design suggestions.

<http://www.voyages-throughtime.org/>

MIT LAUNCHES WEBSITE FOR HIGH SCHOOL STUDENTS



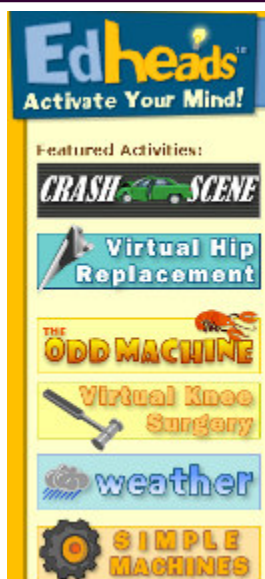
MITOPENCOURSEWARE

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

MIT President Susan Hockfield announces today the launch of a new website, Highlights for High School that will provide resources to improve science, technology, engineering, and math (STEM) instruction at the high school level.

The website builds on the success of MIT's revolutionary OpenCourseWare initiative and is designed to inspire the next generation of engineers and scientists and to be a valuable tool for high school teachers.

<http://ocw.mit.edu/OcwWeb/hs/home/home/index.htm>



Edheads brings you high quality, free educational activities for your classroom!

Edheads helps students learn through educational games and activities designed to meet state and national standards. We partner with various school systems in the United States, which help us research, design and test our activities every step of the way!

Free lessons and resources include vehicle crash scene investigation, virtual hip replacement, and much more!

Activities include...

- Crash Scene
- Virtual Hip Replacement
- Knee Surgery
- Simple Machines
- Compound Machines

<http://www.edheads.org/>

THE ELECTRONIC LIE DETECTOR

This is a good electronics project for groups: technology classes, camps, etc. A "lie detector" test--more correctly called a polygraph test-- is really a whole battery of tests. It measures physical changes in our bodies when we undergo psychological stress. Measurements include pulse (how fast your heart

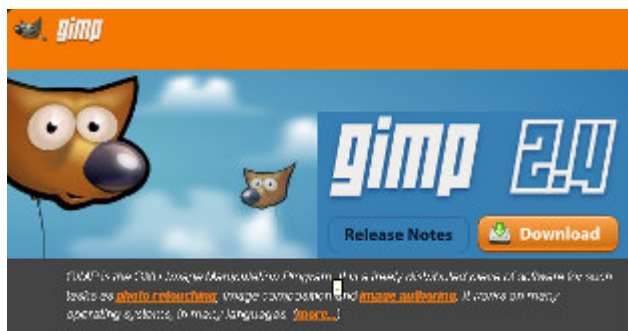


beats), blood pressure, respiration (how fast you breath) and how much your hands perspire. I think they say something about "galvanic skin resistance", but it comes down to sweat. The more you sweat, the better your

skin conducts electricity. That is what this project does: it measures how good you, or anything, conducts electricity.

Find more at:

<http://www.sciencetoymaker.org/>



Graphic Image Manipulation Program

GIMP is the GNU Image Manipulation Program. It is a freely distributed piece of software for such

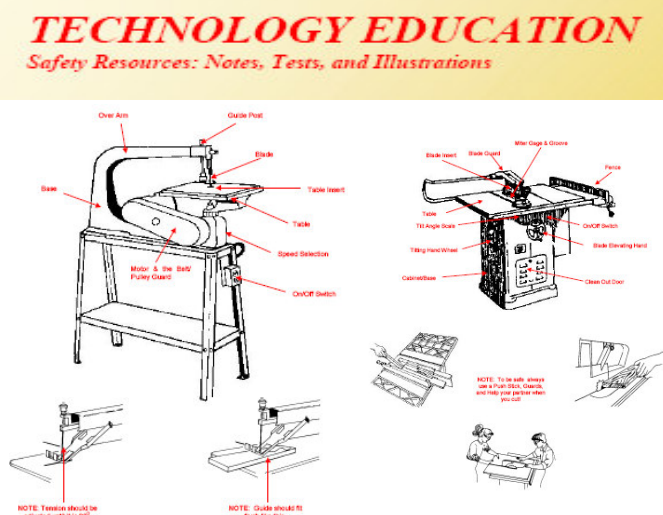
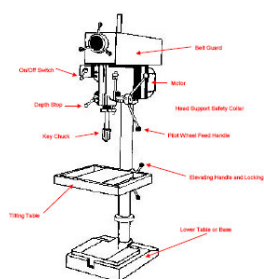
tasks as photo retouching, image composition and image authoring. It works on many operating systems, in many languages. The

official GIMP web site contains information about downloading, installing, using, and enhancing it. This site also serves as a distribution point for the latest releases. We try to provide as much information about the GIMP community and related projects as possible.

<http://www.gimp.org/>

Texas Technology Education Safety Guide

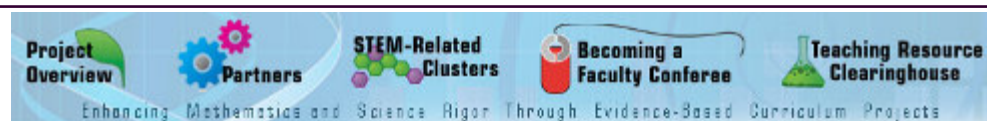
http://www.utttyler.edu/technology/teig/safety_guide.pdf



Suited for Spacewalking Educator Guide

Examines the technology behind space suits. Students learn about the environment of space, the history of spacewalking, NASA's current space suit, future space suits, and work that astronauts do during spacewalks. (National Aeronautics and Space Administration)

<http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/>



STEM Transitions

Welcome to the home of STEM Transitions: Enhancing Mathematics and Science Rigor

Through Evidence-Based Curriculum Projects.

This new initiative is being led by the Center for Occupational Research and Development (CORD). Funded by the U.S. Department of Education Office of Vocational and Adult Education.

At the heart of the project are the six Science,

Technology, Engineering, and Mathematics (STEM) career clusters that will provide the context for instructional materials demonstrating the convergence of academic and technical content at the two-year college level.

<http://www.stemtransitions.org/>



READY TO USE ACTIVITIES

The Children's Engineering website focuses on providing resources to support you in teaching about design, Engineering and Technology Education for the Elementary Classroom & More!

<http://www.childrensengineering.com>

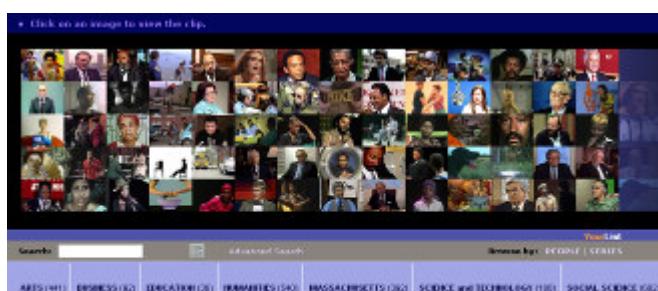


The ETB has produced a new **Enginuity** careers pack which outlines exactly what

engineering is and the wide range of opportunities it affords. The resource pack

illustrates the various careers available to young people, as well as addressing the array of confusing options they face in determining how to get there. The new Enginuity pack has already been sent to over 5,000 secondary schools and can be downloaded from the Enginuity website. The resources are aimed not only at young people, but also at teachers and advisers.

<http://www.enginuity.org.uk/>



open vault
WGBH MEDIA LIBRARY AND ARCHIVES

**Public television station
WGBH opens its vault to
educators**

Educators who want to engage their students and add sizzle to their lessons



by using video clips and interview transcripts can turn to "Open Vault," a new web site launched by Boston-based public television station WGBH. The site features video clips and interviews from WGBH programming created between 1968 and 1993.

<http://openvault.wgbh.org/>



The Japan Fulbright Memorial Fund (JFMF) Teacher Program

Sponsored by the Government of Japan, provides American primary and secondary school teachers and administrators with fully-funded short-term study tours of Japan. The

program is designed to increase understanding between the people of Japan and the United States by inviting U.S. elementary and secondary educators to visit Japan and share their experiences with fellow Americans upon their return. JFMF participants travel to Japan with other outstanding educators, learn about Japanese culture and education, and return to implement a self-designed plan to share their knowledge and experience

with their students, colleagues and community.

<http://www.iie.org/Website/WPreview.cfm?WID=194>



CamStudio Free Streaming Video Software



CamStudio™

OPEN SOURCE

<http://camstudio.org/>

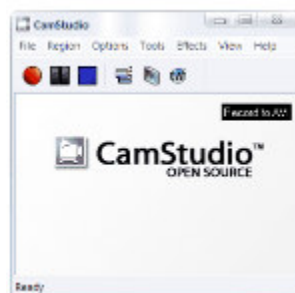


Free Streaming Video Software

CamStudio

Free Streaming Video Software is able to record all screen and audio activity on your computer and create industry-standard AVI video files

and using its built-in SWF Producer can turn those AVIs into lean, mean, bandwidth-friendly Streaming Flash videos (SWFs)



Game Maker allows students to make exciting computer games, without the need to write a single line of code! Making games with Game Maker is a lot of fun.

<http://www.gamemaker.nl/>

The Solar Cooking Archive

sponsored by Solar Cookers International



The Solar Cooker Archive

Solar cooking is the simplest, safest, most convenient way to cook food without consuming fuels or heating up the kitchen. Many people choose to solar cook for these reasons. But for hundreds of millions of

people around the world who

cook over fires fueled by wood or dung, and who walk for miles to collect wood or spend much of their meager incomes on fuel, solar cooking is more than a choice — it is a blessing.

For millions of people who lack access to safe drinking

water and become sick or die.



<http://solarcooking.org/>

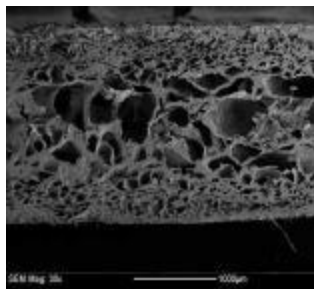
Biotechnology Learning Hub

Bringing Biotechnology and Education together in New Zealand

The Biotechnology Learning Hub

will be adding more teaching resources to the Potato plate story during 2009. You can register to receive updates on the Biotechnology Learning Hub at

www.biotechlearn.org.nz/user/register



You can also contact Biotechnology Learning Hub at enquiries@biotechlearn.org.nz with comments or feedback.

<http://www.biotechlearn.org.nz/>



Games Machines Play

A ton of **Free** online videos from Scientific American Frontiers.

<http://www.pbs.org/saf/1208/video/watchonline.htm>

Talk By Lightning Telegraph

Dot-dot-dot; dot; dotdash-dot-dot; dot-dashdot-dot; dash-dash-dash. That's Morse Code for Hello! Named after the American inventor Samuel Morse, Morse code is a system of short dots and longer dashes which represent the letters of the alphabet.

Signals are sent by starting and stopping the

flow of electricity through a wire. You can make your own telegraph for sending secret messages to a friend. This project may require a trip to the store, some patience, and maybe a bit of help, but it's well worth it. After connecting all your wires and buzzers, you'll be able to "talk by lightning" (as telegraphy was once called).

<http://www.yesmag.ca/projects/telegraph.html>



Connecting learning to the real world

The Futures Channel was founded in 1999 with the goal of using new media technologies to create a channel between the scientists, engineers, explorers and visionaries who are shaping the future, and today's learners

who will one day succeed them.

To produce and distribute high quality multimedia content which educators in any setting can use to enliven curriculum, engage students and otherwise enhance the learning experience.

To connect mathematics, science, technology and engineering to the real world of careers and achievement, so that students can envision a

context and purpose for what they are learning allowing them to envision their own successful futures.

To provide a channel through which professionals from the sciences, engineering and technology sectors can reach their future workforce prospects and interest them in their fields.

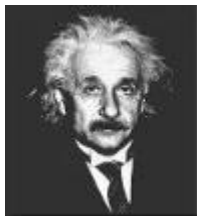
<http://www.thefutureschannel.com>

You Innovate!

This website will bring science, technology, engineering, and math to life for children, which in turn will give them the tools to become innovators.

<http://www.youinnovate21.net>





The Albert Einstein Distinguished Educator Fellowship Program

Where Classroom Practice Informs Policy

ALBERT EINSTEIN DISTINGUISHED EDUCATOR FELLOWSHIP PROGRAM SEEKS APPLICANTS

The program seeks teachers who have a strong background of teaching. Fellows will spend a school year living and working in

Washington, DC. It provides current public or private elementary and secondary science, mathematics, and technology classroom teachers with demonstrated excellence in teaching an opportunity to serve in the national public policy arena. Fellows bring to Congress and appropriate branches of

the federal government the extensive knowledge and experience of classroom teachers. They provide practical insights and "real world" perspectives to policy makers and program managers developing or managing education programs.

<http://www.trianglecoalition.org/ein.htm>



ROBOT HANDS work like our real hands... with strings attached. More projects here!

<http://www.sciencetoymaker.org/robothand/>



Engineering and Technology Education Division

The Association for Career and Technical Education (ACTE) has expanded its focus to include K-12 engineering educators. Additional information can be found on the ACTE website at

<http://www.acteonline.org>



The I-STEM Resource Network

I-STEM is a partnership of Indiana's public and private higher education institutions, K-12 schools, business, and government.

It supports K-12 teachers and leaders working to

implement high academic standards towards STEM literacy for all students.

It also provides Indiana education leaders with new knowledge about teaching and learning.

<http://www.istemnetwork.org/about/>



Build a Foxhole Radio!

During World War II, GIs in the field built really amazing simple radios to listen too. These were made with materials that they could get their hands on and were small enough to carry around in a big pocket. You can modify this design if you want to set it up so that it's tunable too! This project is similar to a simple crystal radio but crystals were hard to get a hold of for the soldiers and so they made do. Radio making runs in my family. My Grandpa Charlie made

his own radios in the 30s and during the war as well. In fact, in a recent email, he mentioned that they were encouraged to make radios and "learn by doing." Radios were the hottest technology of the time and after the exhilaration of getting this radio work.

http://cachefly.oreilly.com/make/wp_foxholeradio.pdf



Design a Cell Phone

Help engineering director Elena design and manufacture a cell phone to help senior citizens get the most out of new technology!

<http://www.edheads.org/>

Design a Strong Arm Cantilever Project

A cantilever is a structure that sticks out from a support and usually bears a load of some kind. Cantilevers are used everywhere. The most common use is as a support to hang signs, but they are also used in bridge construction. With this project you will be the engineer. You will design and build a cantilever structure (a "strong arm")

a minimum of 60 cm out from the side of a table using only newspaper, string, and tape.

http://www.yesmag.ca/projects/strong_arm.html



The Compound Machine

Learn how forces and simple machines can work together to create The Compound Machine!

<http://www.edheads.org/>

Paper Animation Kits

Flying Pig Paper Animation Kits are paper models you make that move. Easy to assemble, fun to share, great gifts, each of our paper animation kits comes as a booklet of parts ready to pop out and assemble. Check out the FREE samples here!

<http://www.flying-pig.co.uk/pages/freedownloads.html>



These simple to download files are ready for you to print out on your home printer. Just cut out the pieces and make your own delightful models - free!



Updated! The Agreeable Sheep



Origami Envelope



Snap-Up Squid



Combination Lock Extra.



Simple Machines Activities

Learn about simple and compound machines while you explore the House and Tool Shed.

<http://www.edheads.org/>



INNOVATION GENERATION PROGRAM INSPIRES KIDS TO EXPLORE INNOVATION AND TECHNOLOGY

Featuring kids, interactive games, cartoon characters like Pete the

three-eyed monster, and animated graphics, the Innovation Generation program is a new online community for children to explore their curiosity,

experience the effect of innovation, and create new and exciting ideas...

<http://www.igenstudio.com/>



Girls' E-Mentoring in Science, Engineering & Technology (GEM-SET),

run by the UIC Women in Science and Engineering is an on-line program that connects middle and high school girls with mentors through a discussion forum.

Girls are able to send in career questions and comments and mentors respond with advice and recommendations to promote interest in science, engineering and technology (SET).

The site also provides a list of partner programs and organizations across

the United States that promote SET for girls. Utilize this as a stand-alone resource or as part of a larger girls in science program.

<http://www.uic.edu/orgs/gem-set/q4.htm>

Engineering Education Service Center

The EESC (Engineering Education Service Center)

winner of the Engineering Dean Council's Award for the promotion of engineering education and careers, is the leader in developing engineering education and career products that truly

motivate, inspire, and educate.

membership compliments and supplements other programs already in schools such as Project Lead the Way, The Academy of Engineering and Synergistic Learning Systems. It also enhances competitions such as FIRST Robotics,

TEAMS, Mathcounts and Future City just to name a few... It also provides progressive and sustainable resources for engineering programs and summer camps.

<http://www.engineeringedu.com>

IMAX
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We are pleased to be able to offer you at NO cost an annual membership card.

This membership card will allow the holder unlimited visits the IMAX Theater Indiana State Museum.

All you need to do is to completely fill-out this registration form. Offer is extended to all active Indiana educators

<http://www.imax.com/indy/iec/>

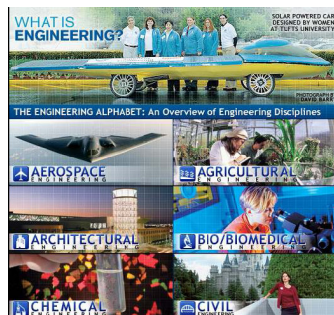
Engineering Alphabet

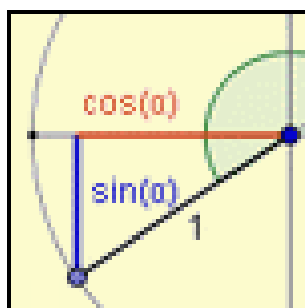
Whether it's cell phones, digital cameras, DVD's or facial recognition devices that can pick out a terrorist in a crowded football stadium, engineers are behind almost all of today's exciting technology. Engineers are problem solvers who search for quicker, better, and less expensive ways to use the forces and materials of nature to meet today's challenges. Engineering technology

uses the knowledge of mathematics and natural sciences to create and enhance technologies that benefit humanity. For example, engineering technologists and

technicians help make the bridges, buildings, computers, electrical appliances, power plants, and transportation systems we rely upon.

http://www.engineeringk12.org/students/What_Is_Engineering/Engineering_Alphabet/default.php





GeoGebra

is a dynamic geometry system. You can do constructions with points, vectors, segments, lines, conic sections as well as functions and change them dynamically afterwards. Equations and coordinates can be entered directly. GeoGebra has the ability to deal with variables for numbers, vectors and points, finds derivatives and integrals of functions and offers commands like Root or Extremum. These two views are characteristic of GeoGebra: an expression in the algebra window corresponds to an object in the geometry window and vice versa.

<http://www.educational-freeware.com/freeware/>

NASA eClips

These videos inspire and engage students, helping them see real world connections. New video segments are produced weekly exploring current applications of science, technology, engineering and mathematics, or STEM topics. The programs are produced for targeted audiences: grades K-5, 6-8, 9-12 and the general public. NASA eClips offer unlimited

flexibility in the classroom for timing, sequencing, and pacing instruction to meet the needs of students and classroom instructors.

Educational material for this program is selected based on national curriculum standards



identified by: NCTM, NSTA, ISTE and Project 2061.

<http://www.nasa.gov/audience/foreducators/nasaclips/index.html>



Repurposed Computers for Indiana Schools

Does your school have a need for more computers in your classrooms but struggles to find funding to purchase more? The state of Indiana makes "surplus" or "repurposed" computers available to eligible educational entities at no charge to the school. Currently, the surplus includes Pentium

III and IV type computers.

The Corporation for Educational Technology (CET) serves as a facilitator between those who qualify and the Indiana Department of Administration's State Surplus organization.

While there is **no charge** for the computers, schools must transport the computers from the State warehouse to their school location.



http://www.doe.in.gov/super/2008/08-August/082908/repurposed_computers.pdf

teachers'domain®

Multimedia Resources for the Classroom and Professional Development



Teachers' Domain
The Teachers' Domain is a free digital library of K-12 classroom-ready resources from public television and other partnering organizations. The site features multimedia resources along with background essays, media-rich lesson

plans, and correlations to academic standards. As a non-commercial, educational resource, Teachers' Domain has a large, established user base - we now serve more than 140,000 registrants representing 145 countries and nearly 40% of the public schools

in the U.S. You can "Take a Test Drive" on the site to browse our resources and view the "Teachers' Domain in Action" video.

<http://www.teachersdomain.org/>



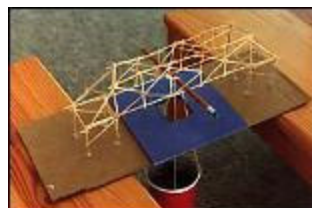
A Bridge Over Cardboard Water

A group of triangles can be joined together to form a truss. There are many different truss designs, including the Pratt, Whipple, and Fink (sounds like a law firm). Although truss bridges are not as good for spanning great distances

as other bridge designs, they are extremely strong.

Steel trusses, for example, are often used in railroad bridges. To build your own truss bridge, you need a steady hand and a bit of patience. But if you stick with it, you will have one terrific truss bridge.

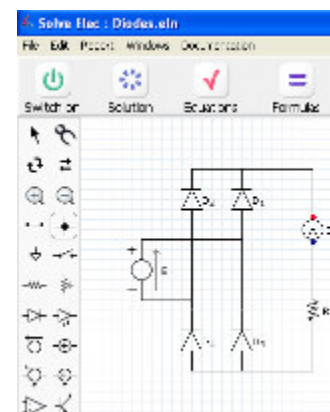
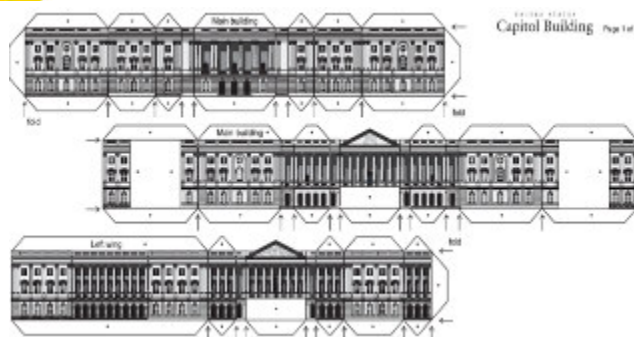
<http://www.yesmag.ca/projects/bridge.html>



Paper Toy Models

Website features completely free, print, cut, fold and glue resources for architectural modeling.

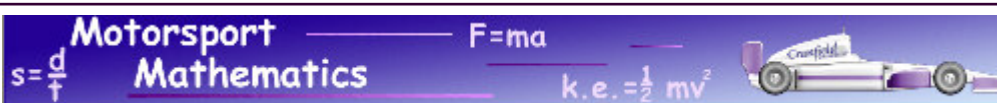
<http://www.papertoys.com/>



Solve Elec - Electrical circuits Analysis and Resolution

With Solve Elec you can draw and analyze electrical circuits functioning in direct current, get literal formulas and values for current intensities and voltages defined in the circuit and verify circuit related equations.

<http://www.educational-freeware.com/freeware/solveelec.aspx>



Motorsport Mathematics

Website features how mathematics and physics is applied in motor sports with plenty of resources and examples!

<http://www.racemath.info/Index.htm>





Alice is a teaching tool for introductory computing. It uses 3D graphics and a drag-and-drop interface to facilitate a more engaging, less frustrating first programming experience.

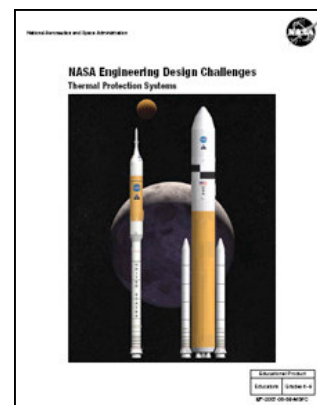
<http://www.alice.org/>

Engineering Design Challenges: Thermal Protection Systems Educator Guide -- Grades 6-9

In this challenge, students learn how NASA engineers design lightweight but effective, reusable thermal protection systems. Students work in teams to design, build and test a thermal protection system of their own. Simple materials such as wooden dowels, hot-melt glue,

aluminum foil and copper screening are used to build a simulated spacecraft and a thermal protection system that can withstand the heat of a propane torch. The TPS is tested under a stringent protocol to maintain classroom safety.

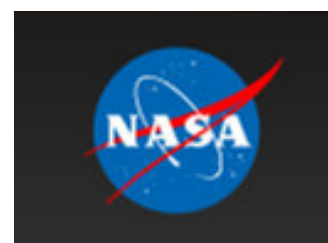
http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/EDC_TPS.html



Engineering Design Challenges: Spacecraft Structures Educator Guide -- Grades 6-9

In this challenge, students will undertake the problem of designing a strong but lightweight thrust structure that can withstand the launch of a bottle rocket by means of a wooden lever. By using simple materials such as craft sticks, cardboard

and hot-melt glue, students strive to make their structure lighter while maintaining its strength. The goal is to construct a launcher that can withstand the force of repeatedly launching a one-kilogram bottle of water one meter into the air. The scientific focus is on understanding forces, structures and energy transfer.



http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/EDC_Spacecraft_Structures.html



Join the ITEA Engineering Education TIG

This forum is dedicated to those interested in the topic of engineering education. As defined in Standards for Technological Literacy, engineering involves the knowledge of the

mathematical and natural sciences (biological and physical) gained by study, experience, and practice that are applied with judgment and creativity to develop ways to utilize the materials and forces of nature for the benefit of mankind (ITEA, 2002).

All individuals are invited to join ITEA's **Technology Interest Groups (TIG)**. TIGs are designed to facilitate dialogue between professionals with an interest in specific technological issues or initiatives. These

forums were created for the purpose of sharing information, advancing education, and creating progress in the study of technology, innovation, design, and engineering education.

Non ITEA members may join any one TIG at no cost. ITEA members may join as many TIGs as desired.

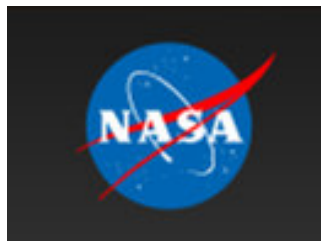
<http://www.iteaconnect.org/Networking/technologyinterestgroups.htm>

Hands-on Activity in Rocket Building

Designed for students in grades 5-8, video clips from the "NASA CONNECT™: The Festival of Flight: Opening Space for Next Generation of Explorers DVD" show students performing a hands-on activity to find the optimum ratio of baking soda to a controlled amount of vinegar to power a baking soda and

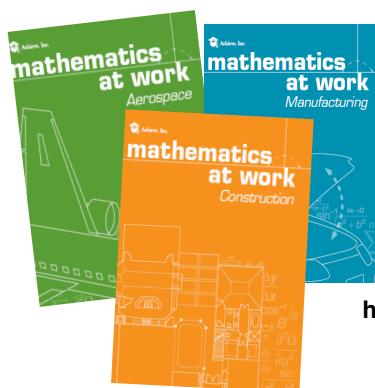
vinegar rocket. The series also explores the concept of gravity and how Newton's three laws help rockets overcome the force of gravity.

http://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Hands_On_Activity_in_Rocket_Building.html



Mathematics at Work

Following up on the work of the American Diploma Project, Achieve has produced a series of "Mathematics at Work" brochures to examine how higher-level mathematics is used in today's workplaces. The brochures present case studies drawn from leading



industries nationwide to illustrate the advanced mathematics knowledge and skills embedded in jobs that offer opportunities for advancement and are accessible to high school graduates.

<http://www.achieve.org/mathatwork>



Scratch animations

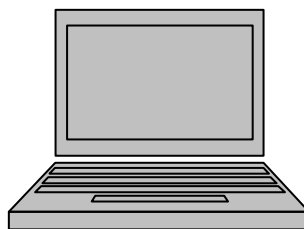
consist of sprites that you animate by visually dragging MOVE blocks into the Scripts area in the Scratch interface. Multiple sprites can be created and interact with one another. Use built-in sprites or draw your own using a drawing tool. You can change how a sprite looks by giving it a different costume.

<http://www.educational-freeware.com/freeware/scratch.aspx>

Intel — The *Journey InsideSM* is a collection of 35 interactive, online lessons for students to learn about technology, computers, and society.

Many of the lessons utilize interactive, media-rich Flash* activities, virtual field trips, and videos demonstrating the ideas discussed to guide students to an increased understanding of the world of technology. Students, teachers, and

anyone interested can work on the lessons and activities at their own pace to complete any or all of the six sections: Introduction to Computers, Circuits and Switches, Digital Information, Microprocessors, The Internet, and Technology and Society. Detailed instructional strategies written for the teacher extend the lessons and key concepts in the classroom.



<http://www.intel.com/education/>

NEWS AND
RESOURCES FOR
TEACHERS OF
ENGINEERING &
TECHNOLOGY
EDUCATION

Mike Fitzgerald
Technology Education Specialist
Indiana Department of Education
mfitzger@doe.in.gov
317-232-6990

It is the policy of the Indiana Department of Education not to discriminate on the basis of race, color, religion, sex, national origin, age, or disability, in its programs, activities, or employment policies as required by the Indiana Civil Rights Law (I.C. 22-9-1), Title VI and VII (Civil Rights Act of 1964), the Equal Pay Act of 1973, Title IX (Educational Amendments), Section 504 (Rehabilitation Act of 1973), and the Americans with Disabilities Act (42 USCS §12101, et. seq.).

Inquiries regarding compliance by the Indiana Department of Education with Title IX and other civil rights laws may be directed to the Human Resources Director, Indiana Department of Education, Room 229, State House, Indianapolis, IN 46204-2798, or by telephone to 317-232-6610, or the Director of the Office for Civil Rights, U.S. Department of Education, 111 North Canal Street, Suite 1053, Chicago, IL 60606-7204



Indiana Tech Flash

The screenshot shows the Indiana Department of Education website. At the top is the 'IN.gov' logo and a search bar. Below the logo are navigation links for various state departments. The main header reads 'Indiana Department of Education SUPPORTING STUDENT SUCCESS'. A sidebar on the left contains links for 'DOE HOME', 'STREAMING VIDEO HOME', and 'ABOUT US'. The main content area features a video player titled 'Dr. Tony Bennett's Podcast April 3rd, 2009' with a 'Download This Video' button. The video player shows a man speaking, with the text 'Dr. Tony Bennett's Podcast April 3, 2009' overlaid.

The document is titled 'THE VISION' and 'THE PLAN' from the Indiana Department of Education. The vision statement reads: 'The academic achievement and career preparation of all Indiana students will be the best in the United States and on par with the most competitive countries in the world.' The plan is divided into two main sections: 'THE VISION' and 'THE PLAN'. Under 'THE PLAN', there are three main points: 1. Create and promote a statewide culture of academic excellence, in which at least: a) 90% of students pass both Math and English/Language Arts sections of ISTEP+ and End-of-Course Assessments; b) 25% of all graduates receive a score of 3, 4 or 5 on at least one Advanced Placement exam, a 4 or higher on an International Baccalaureate exam, or receive the equivalent of 3 semester hours of college credit during their high school years; and c) 90% of students graduate from high school. 2. Institute and sustain an emphasis on reading at the elementary level and integrate reading and writing into all content areas to ensure students are able to comprehend and to apply new knowledge across the curriculum and in practical settings. 3. Advance learning in the Science, Technology, Engineering and Mathematics (STEM) areas. 4. Drive college preparedness by designing and implementing a coherent Advanced Placement (AP) course strategy, including a focus on AP readiness at the middle school level and an aggressive dual-credit strategy. 5. Focus on middle school success by ensuring an engaging learning environment that demands academic rigor, begins career preparation awareness and builds upon elementary achievement in basic skills. 6. Integrate Title I, English Language Learners (ELL), High Ability and Special Education programs seamlessly into the learning environment by focusing on meeting the needs of the child and complementing the learning experience. 7. Create multiple pathways for learning that enable all students to attain postsecondary success. 8. Create a vibrant statewide Career and Technical Education program through the creation of state of the art Programs of Study that integrate rigorous academic standards, prepare students

See the NEW IDOE Vision and Plan at:
<http://www.doe.in.gov/actionplan/index.html>